HITACHI

PA **No. 0101**

60EX38B

SERVICE MANUAL

NTSC AP52P Chassis

R/C: CLU-415UI

This addendum gives differences between 60EX38B and the 55EX15K. For any other information, see the 55EX15K Service Manual PA No. 0048 issued in September 1995.

CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product Safety Notices" in Service Manual PA No. 0048.

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale smoke or fumes produced.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PROJECTION COLOR TELEVISION

May 1998 HHEA-MANUFACTURING DIVISION

SPECIFICATIONS

Model:	60EX38B	
Cathode-Ray Tube:	80° deflection 7 inch P16LGD00RFA(AU) P16LGD00HLA(AU) P16LGD00BMB(AU)	
Power Input:	120 volts AC, 60Hz	
Power Consumption:	205 watts - Maximum 150 watts - Operating	
Antenna Impedance:	75 ohm Unbalanced VHF/UHF/CATV	
Receiving Channel:		CH
	VHF	2-13
	EXT. Mid	(A-2)-(A-1),4+
	CATV Mid	A-I
	CATV Super	J-W
	CATV Hyper	(W+29)-(W+53)
Intermediate Frequency:	Picture I-F Carrier 45.75 MHz Sound I-F Carrier 41.25 MHz Color Sub Carrier 42.17 MHz	
Video Input:	1 Voltp-p 75 ohm	
Video Output:	1 Voltp-p 75 ohm	
Audio Input:	0.47 volt rms, 47 k ohm	
Stereo Audio Output:	0.47 volt rms, 1k ohm	
Audio Output Power:	Front – 8 watts rms per channel, 8 ohm impedance. Rear – 4 watts per channel, 8 ohm impedance.	

Anode Voltage:	30.0kV (Zero Beam Current)
Speakers:	**60EX38B** 2 Woofers - 6 in. (16 cm) round
Dimensions:	**60EX38B**
Height (in.)	$60\ ^{7}/_{16}$
Width (in.)	$51\ ^{3}/_{8}$
Depth (in.)	$29\ ^{9}/_{16}$
Weight (lbs.)	223
Circuit Board Assemblies:	CPT (B) P.C.B. CPT (G) P.C.B. CPT (R) P.C.B. Signal P.C.B. Deflection/Power Supply P.C.B. Control P.C.B. Terminal P.C.B. V.M. P.C.B. Convergence Correction P.C.B. Speaker Terminal P.C.B.

CIRCUIT PROTECTION

Fuse (or Device)	Circuit Protected	Physical Location
F902 5A/125V AC	Main Fuse	Power/Defl. Circuit Board
F903 5A/125V DC (MINIFUSE)	Main Fuse	Power/Defl. Circuit Board
F905 4A/125V DC (MINIFUSE)	26V Supply (Audio)	Power/Defl. Circuit Board
F906 1.6A/125V DC	115V (+B) Supply	Power/Defl. Circuit Board

Adjustment Addition

Note: All adjustments for the 60EX38B (AP52P chassis) are the same as the 55EX15K (AP52 chassis) found in Service Manual PA. NO. 0048. However, the Dynamic Convergance adjustment has been modified as described below.

The 60EX38B convergence correction P.W.B. incorporates 2 adjustable coils (LT03 and LT06). These coils are intended to be used for RED color "GULLWING" correction of the top and bottom horizontal lines.

If the top and bottom horizontal lines (RED color only) cannot be made straight by the Dynamic Convergence adjustment in Service Manual PA. NO. 0048, adjust coils LT03 and LT06 until they become straight.

This Parts List only gives parts which are different from the 55EX15K.

REPLACEMENT PARTS LIST

PRODUCT SERVICE NOTE: Components marked with ⚠ have special characters important to safety.
Before replacing any of these components read carefully, the PRODUCT SAFETY NOTICE of this Service Manual.
Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
		CAPACITORS	RUE5	0700053M	CF 1/16W 8.2K-JB
CT52	0880012R	MYLAR 0.022U	RUG2	0700049M	CF 1/16W 4.7K-JB
CT53	0299029	PF 0.015U 100V	RUG3	0700054M	CF 1/16W 10K-JB
			RUH2	0700054M	CF 1/16W 10K-JB
		COILS	RUK1	0700052M	CF 1/16W 6.8K-JB
LT01	BH00974	HC-332KS1-71064	RUK4	0700041M	CF 1/16W 1.0K-JB
LT03	BH00961	COIL VARIABLE 3.3MH	RUR1	0700048M	CF 1/16W 3.9K-JB
LT04	BH00974	HC-332KS1-71064			
LT06	BH00961	COIL VARIABLE 3.3MH			**MISCELLANEOUS**
LT07	BH00974	HC-332KS1-71064	1	UE01583	98EX CONTROL PANEL ASSY
			4	NA11702	LENS CRT METAL (NON-BLACK)
			13	KS00167	MIRROR 60EX
		RESISTORS	21	QD05691	60EX38B CABINET ASS'Y
RT38	0700061M	CF 1/16W 33K-JB	22	QD04111	60" BACK COVER
RT41	0700058M	CF 1/16W 22K-JB	27	NT00743	60" SCREEN FRAME ASS'Y
RT70	0700044M	CF 1/16W 1.8K-JB	⚠31	KQ00811	DELTA 38 A/B ASSY RGB
RT87	0700059M	CF 1/16W 27K-JB	⚠32	KQ00811	DELTA 38 A/B ASSY RGB
RT89	0700067M	CF 1/16W 100K-JB	34	H512227	REAR BOARD
RT92	0700058M	CF 1/16W 22K-JB	⚠40	UE04781	60EX38B LENS CRT B.ASY(RED)
RT98	0700061M	CF 1/16W 33K-JB	⚠41	UE04782	60EX38B LENS CRT B.ASY(GREEN)
RTA3	0700041M	CF 1/16W 1.0K-JB	⚠42	UE04783	60EX38B LENS CRT B.ASY(BLUE)
RTA6	0700067M	CF 1/16W 100K-JB	45	KR00273	SCREEN ASSY
RTK5	0700058M	CF 1/16W 22K-JB	47	32110054	60EX SPEAKER GRILL ASSY
RTL6	0700057M	CF 1/16W 18K-JB	55	NA11681	MIRROR METAL A
RTL7	0700061M	CF 1/16W 33K-JB	56	NA11691	MIRROR METAL B
RU03	0700051M	CF 1/16W 5.6K-JB	#114	33200051	BACK CENTER BAR 60"
RU07	0700043M	CF 1/16W 1.5K-JB	#115	33010192	BARRIER BOARD
RU27	0700051M	CF 1/16W 5.6K-JB	#116	55020039	FRONT BOARD ASSY 60"
RU40	0700053M	CF 1/16W 8.2K-JB	N201	QR21002	60EX38B-511 INSTRUCTION BOOK
RU43	0700048M	CF 1/16W 3.9K-JB	V1R	DE00824	P16LGD00RFA(U)/P16LGD00RFA(AU)
RU59	0700051M	CF 1/16W 5.6K-JB	V1G	DE00825	P16LGD00HLA(U)/P16LGD00HLA(AU)
RU64	0700046M	CF 1/16W 2.7K-JB	V1B	DE00826	P16LGD00BMB(U)
RU84	0700052M	CF 1/16W 6.8K-JB		UE04771	60EX38B LENS CRT CHASS.B.ASY
RU95	0700052M	CF 1/16W 6.8K-JB			
RU97	0700051M	CF 1/16W 5.6K-JB			
RUA9	0700043M	CF 1/16W 1.5K-JB			

HITACHI

HITACHI

PA	No. 0082

50EX20B

SERVICE MANUAL

NTSC　AP52 Chassis

R/C: CLU-415UI

This addendum gives differences between 50EX20B and the 55EX15K. For any other information, see the 55EX15K Service Manual PA No. 0048 issued in September 1995.

CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product Safety Notices" in Service Manual PA No. 0048.

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale smoke or fumes produced.

REPLACEMENT PARTS LIST

This parts list only gives parts which are different from the 55EX15K.

PH02572 →

SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
1	UE01582	Control Block	47	H310924	Speaker Grille
27	NT00078	Screen Frame Ass'y	55	H420673	Mirror Metal A
30	H310666	Deco Panel	56	H420682	Mirror Metal B
34	H512221	Lower Rear Cover	N201	QR21001	Instruction Book
⚠40	UE02681	Lens CRT Block Ass'y (R)	V1R	DE01081	180DLB22R
⚠41	UE02682	Lens CRT Block Ass'y (G)	V1G	DE01082	180DLB22G
⚠42	UE02683	Lens CRT Block Ass'y (B)	V1B	DE01083	180DLB22B
45	3189767	Screen Ass'y		UE01814	Lens CRT Chassis B. Ass'y

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PROJECTION COLOR TELEVISION

April 1997　HHEA-MANUFACTURING DIVISION

HITACHI

SERVICE MANUAL

TSC

AP52 Chassis

PA

No. 0048

50EX14BV
55EX15K

R/C: CLU-415UI

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CAUTION: Before servicing this chassis, it is important that the service technician read the “Safety Precaution” and “Product Safety Notices” in this Service Manual.

SAFETY NOTICE
USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by a ⚠on the schematics and on the parts list in this Service Data and its supplements and bulletins. Before servicing the chassis, it is important that the service technician read and follow the “Safety Precautions” and “Product Safety Notices” in this Service Manual.

*For continued x-radiation protection, replace picture tube with original type of Hitachi approved equivalent type.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PROJECTION COLOR TELEVISION

September 1995 HHEA - MANUFACTURING DIVISION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

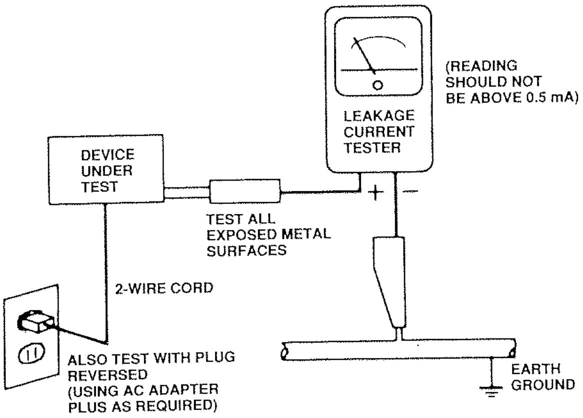
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with solder. Also, when soldering do not inhale any smoke or fumes produced.

This television receiver provides display of television closed captioning in accordance with section 5.119 of the FCC rules.

SAFETY PRECAUTIONS

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including but not limited to the following items:
   a. Be sure that no built-in protective devices are defective and/or have been deleted during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
   b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to (1) spacing between the picture tube and cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.
   c. **Antenna Cold Check** — With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohms or greater than 5.2 megohms, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.
   d. **Leakage Current Hot Check** — With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.0 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.1 milliamps. Reverse the instrument power cord plug in the outlet and repeat test.


(READING SHOULD NOT BE ABOVE 0.5 mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
+
−
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUS AS REQUIRED)
EARTH GROUND

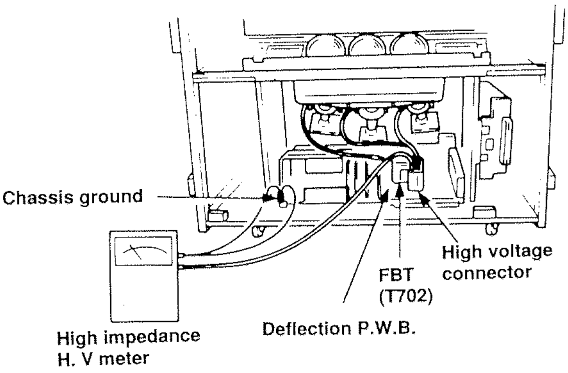
AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

   e. **High Voltage** — This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.
   f. **Serviceman Warning** — With minimum contrast and brightness, operating high voltage in this receiver is lower than **31.6kV.** In case any component having influence on high voltage is replaced, confirm that high voltage with minimum contrast and brightness is lower than **31.6kV.**

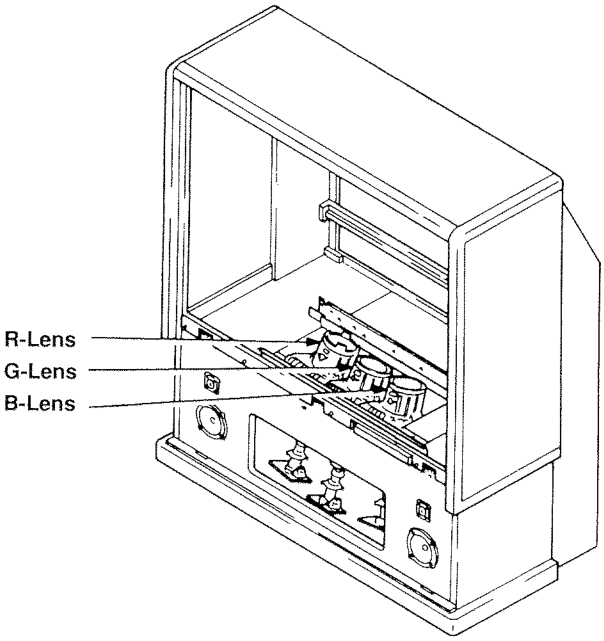
      To measure H.V. use a high impedance H.V. meter. Connect (-) to chassis earth and (+) to the CRT anode button. (See the following connection diagram.)

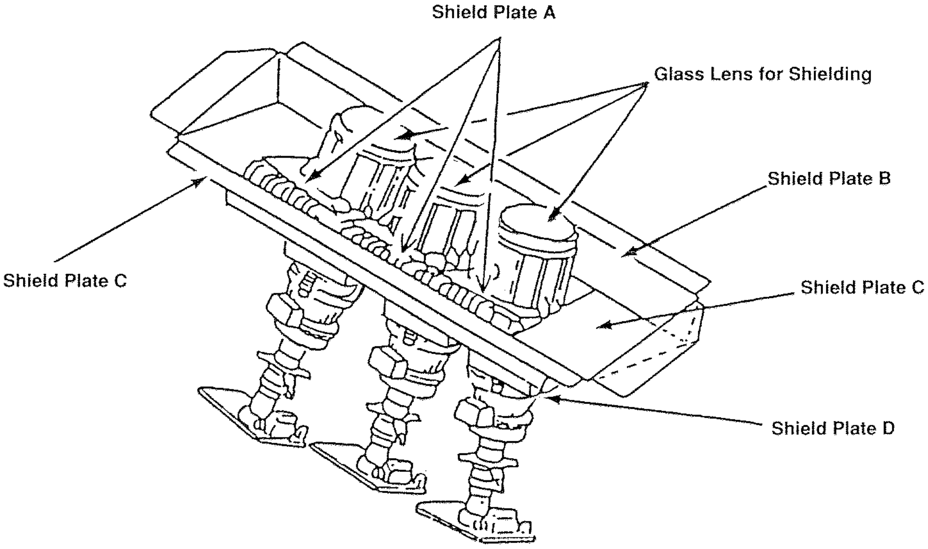
Note: Turn power switch off without fail before the connection to the anode button is made.



g. **X-radiation — TUBE:** The primary source of X radiation in this receiver is the picture tube. The tube utilized for the above mentioned function in this chassis is specially constructed to limit X radiation emissions.
For continued X radiation protection, the replacement tube must be the same type as the original, HITACHI approved type.
When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage component.
Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

h. **X-Radiation Shield —**
1) This receiver is provided X-ray shield plates for the protection of X-radiation. Do not remove X-ray shield plates A, B, C, or D shown in Fig. 1 unnecessarily, when troubleshooting and/or making test measurements.
2) To prevent X-radiation, after replacement of picture tube and lens, confirm these components to be fixed correctly to bracket and cabinet, and not to be taken off easily.





Detailing X-radiation shield.
Fig. 1

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning** — Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connectors, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4. **Picture Tube Implosion Protection Warning** — The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck.

5. **Hot Chassis Warning** — **a.** Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safety serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground. **b.** Some TV receiver chassis normally have 85V AC (RMS) between chassis and earth ground regardless of the AC plug polarity. These chassis can be safely serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection. **c.** Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: **a.** near sharp edges, **b.** near thermally hot parts — be sure that leads and components do not touch thermally hot parts, **c.** the AC supply, **d.** high voltage and **e.** antenna wiring. Always inspect in all areas for pinched, out-of-plate, or frayed wiring. Do not change spacing between components, and between components and the printed circuit board. Check AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. **PRODUCT SAFETY NOTICE** — Many TV electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified Hitachi service data by shading on schematics and by a (⚠) in the parts list. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in Hitachi service data parts list might create shock, fire, and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current Hitachi service literature. A subscription to, or additional copies of Service literature may be obtained at a nominal charge from Hitachi.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this service data and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Guidelines

1. Always unplug the instrument AC power cord from the AC power source before:
   a. Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
   b. Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
   Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc." The H.V. Distribution Box has an internal 400MΩ resistor (bleeder resistor) connected from the high voltage to ground. After power is removed from the instrument the high voltage will discharge through the high voltage bleeder resistor. If the tubes have high voltage after power is removed, then the bleeder resistor is defective or the bleeder ground is disconnected.
3. Discharge the picture tube's anode at any of the R, G, or B outputs on the High Voltage distribution box only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube high voltage distribution box R, G, or B output, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemical on or near this instrument or any of its assemblies.
5. Unless specified otherwise in these service data, clean electrical contacts by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator: 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength). **Caution:** This is a flammable mixture. Unless specified otherwise in these service data, lubrication of contacts is not required.
6. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service data might be equipped.
7. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
8. Always connect the test instrument ground lead to the appropriate instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.
9. Use with this instrument only the test fixtures specified in this service data.
   CAUTION: Do not connect the test fixture ground strap to any heatsink in this instrument.

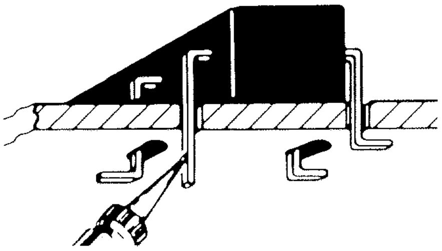
Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range 500°F to 600°F.
2. Use an appropriate gauge of resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique.
   a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
   b. Heat the component lead until the solder melts. Quickly draw away the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
   b. First, hold the soldering iron tip and solder strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil or components.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.



Use Soldering Iron to Pry Leads

IC Removal/Replacement

Some Hitachi unitized chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas.)

"Small-signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact, then solder each connection.

Power Output Transistor Devices Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heatsink mounting screw (if so equipped).
3. Carefully remove the transistor from the circuit board.
4. Insert new transistor in circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicularly to the circuit board.
3. Observing diode polarity, wrap each lead out of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and, if necessary, apply additional solder.

Fuses and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of circuit board hollow stake.
2. Securely crimp leads of replacement component around stake 1/8 inch from top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board, to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board, causing the foil to separate from, or "lift-off," the board. The following guidelines and procedures should be followed whenever this condition is encountered.

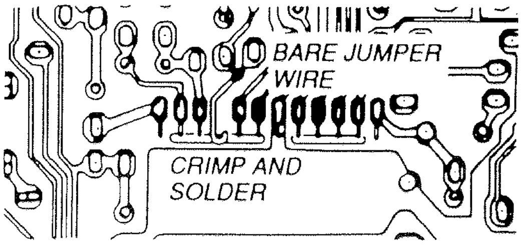
In Critical Copper Pattern Areas

High component/copper pattern density and/or special voltage/current characteristics make the spacing and integrity of copper pattern in some circuit board areas more critical than in others. The circuit foil in these areas is designated as Critical Copper Pattern and is identified and illustrated in this service data in the section titled Safety Related Copper Pattern (see data in the section titled Safety Related Copper Pattern (see table of contents for page number). Because Critical Copper Pattern requires special soldering techniques to ensure the maintenance of reliability and safety standards, contact your Hitachi personnel.

At IC Connections

To repair defective copper pattern at IC connections, use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections.)

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary.)
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.

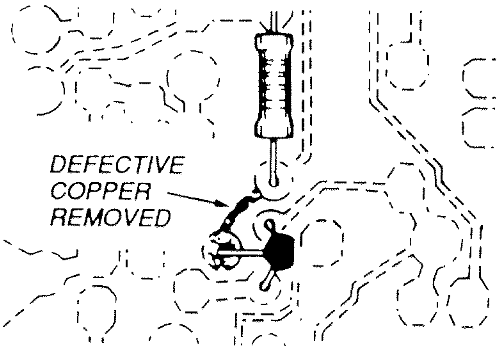


Install Jumper Wire and Solder

3. Bend a small "U" in one end of a small-gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the cut-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area, and clip off any excess jumper wire.

At Other connections

Use the following technique to repair defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.



Insulated Jumper Wire

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

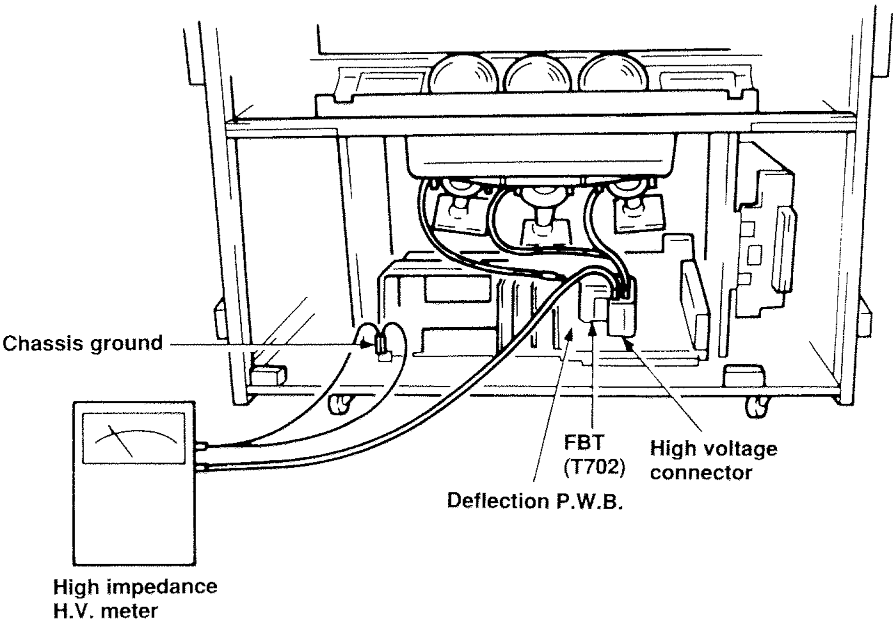
Frequency Synthesis (FS) Tuning Systems

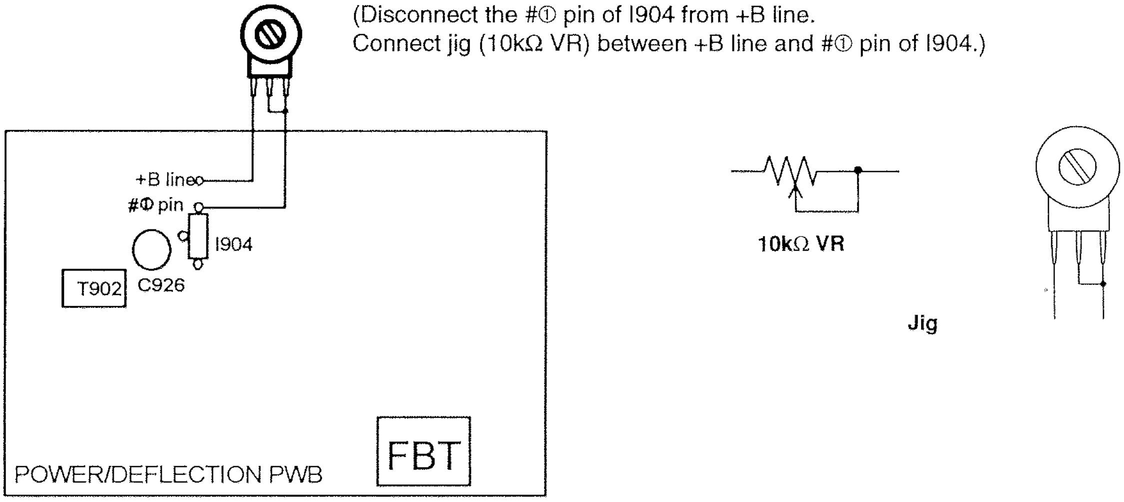
1. Always unplug the instrument AC power cord before disconnecting or reconnecting FS tuning system cables and before removing or inserting FS tuning system modules.
2. The FS tuner must never be disconnected from the FS tuning control module while power is applied to the instrument.
3. When troubleshooting intermittent problems that might be caused by defective cable connection(s) to the FS tuning system, remove the instrument AC power as soon as the defective connector is found and finish confirming the bad connection with a continuity test. This procedure will reduce the probability of electrical overstress of the FS system semi-conductor components.

TECHNICAL CAUTIONS

High Voltage limiter circuit operation check.

1. Turn off TV and connect jig as shown in Figure 2. Adjust jig fully counter-clockwise for minimum resistance.
2. Set the AC input to 120V AC and turn on TV.
3. Confirm test pattern on CRT is a usable picture, then slowly adjust jig until the picture disappears and TV shuts down.
4. When the limiter circuit is operating properly, High Voltage will be less than 35.5kV at 0.6mA when TV shuts down.
5. Turn off set immediately after checking circuit operation.
6. Unplug set for one minute to reset shutdown circuit. Remove jig and voltmeter.


Chassis ground
FBT
(T702)
High voltage
connector
Deflection P.W.B.
High impedance
H.V. meter


+B line
#① pin
I904
T902
C926
FBT
POWER/DEFLECTION PWB
10kΩ VR
Jig

(Disconnect the #① pin of I904 from +B line.
Connect jig (10kΩ VR) between +B line and #① pin of I904.)

Fig. 2 Deflection/Power Supply P.C.B.

SPECIFICATIONS

Model:	50EX14BV 55EX15K
Cathode-Ray Tube:	80° deflection 7 inch 180CSB22R(KU) 180CSB22G(KU) 180CSB22B(KU)
Power Input:	120 volts AC, 60Hz
Power Consumption:	210 watts - Maximum 154 watts - Operating
Antenna Impedance:	75 ohm Unbalanced VHF/UHF/CATV

Receiving Channel:

	CH
VHF	2-13
EXT. Mid	(A-2)-(A-1),4^{+}
CATV Mid	A-I
CATV Super	J-W
CATV Hyper	(W+29)-(W+53)

Intermediate Frequency:	Picture I-F Carrier 45.75 MHz Sound I-F Carrier 41.25 MHz Color Sub Carrier 42.17 MHz
Video Input:	1 Voltp-p 75 ohrn
Video Output:	1 Voltp-p 75 ohm
Audio Input:	0.47 volt rms, 47 k ohm
Stereo Audio Output:	0.47 volt rms, 1 k ohm
Audio Output Power:	Front — 8 watts rms per channel, 8 ohm impedance. Rear — 4 watts per channel, 8 ohm impedance.
Anode Voltage:	30.0 kV (Zero Beam Current)
Brightness:	390 ft-Nominal - 50EX14BV 320 ft-Nominal - 55EX15K (Peak White)

Speakers:	**50EX14BV**	**55EX15K**
	2 Woofers - 5 in. (12 cm) round	2 Woofers - 6 in. (16 cm) round

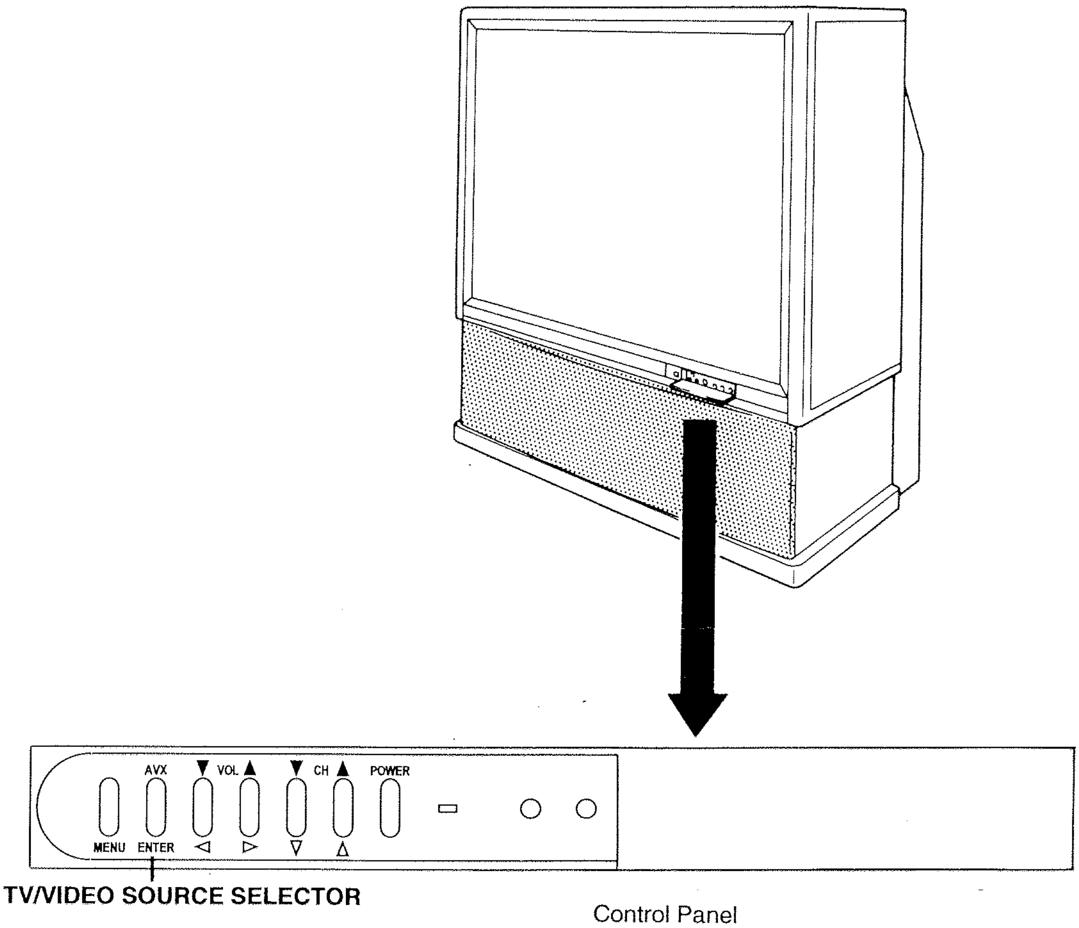
Dimension:	**50EX14BV**	**55EX15K**
Height (in.)	55-1/4	54-9/16
Width (in.)	41-5/8	45-9/16
Depth (in.)	28	26-11/16
Weight (lbs.)	251	210

Circuit Board Assemblies:	CPT (B) P.C.B. CPT (G) P.C.B. CPT (R) P.C.B. Signal P.C.B. Deflection/Power Supply P.C.B. Control P.C.B. Terminal P.C.B. V.M. P.C.B. Convergence Correction P.C.B. Speaker Terminal P.C.B.

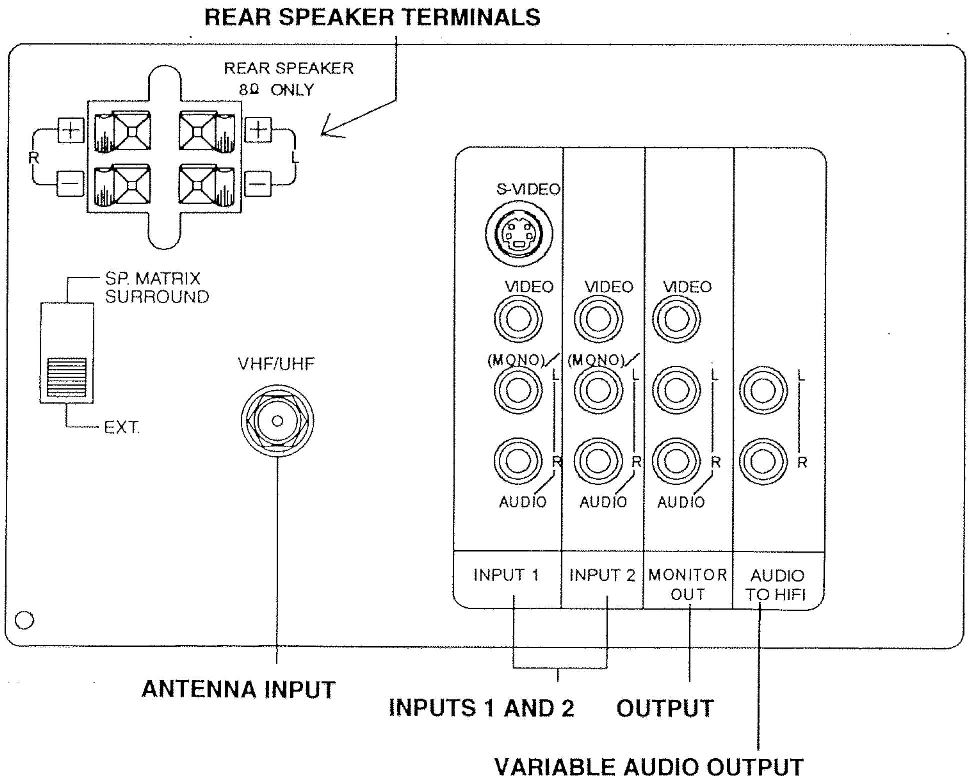
CIRCUIT PROTECTION

Fuse (or Device)	Circuit Protected	Physical Location
F902 5A/125V AC	Main Fuse	Power/Defl. Circuit Board
F903 5A/125V DC (MINIFUSE)	Main Fuse	Power/Defl. Circuit Board
F905 4A/125V DC (MINIFUSE)	26V Supply (Audio)	Power/Defl. Circuit Board
F906 1.6A/125V DC	115V (+B) Supply	Power/Defl. Circuit Board

GENERAL INFORMATION


AVX
▼ VOL ▲
▼ CH ▲
POWER
MENU
ENTER
◁
▷
▽
△
TV/VIDEO SOURCE SELECTOR

Control Panel
Fig. 3

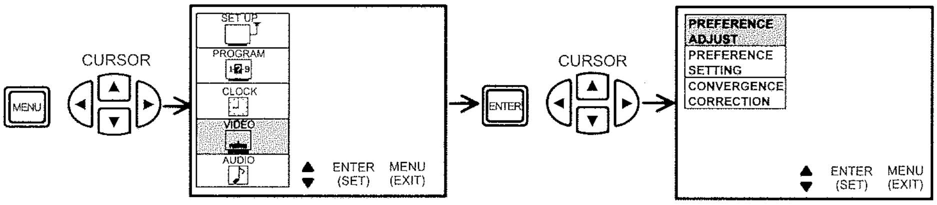

REAR SPEAKER TERMINALS
REAR SPEAKER
8Ω ONLY
R
L
SP. MATRIX
SURROUND
EXT.
VHF/UHF
S-VIDEO
VIDEO
VIDEO
VIDEO
(MONO)
(MONO)
L
R
AUDIO
AUDIO
AUDIO
INPUT 1
INPUT 2
MONITOR OUT
AUDIO TO HIFI
ANTENNA INPUT
INPUTS 1 AND 2
OUTPUT
VARIABLE AUDIO OUTPUT

Rear Connections Panel
Fig. 4

ADJUSTING FOR PICTURE AND SOUND FUNCTIONS

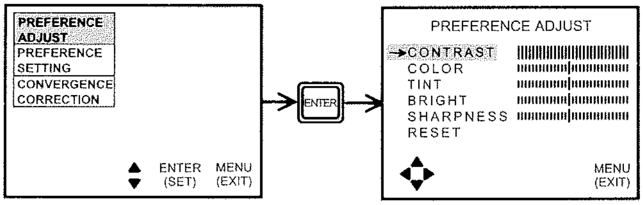
VIDEO

Select VIDEO to adjust picture settings, improve picture quality, and to adjust convergence.


MENU
CURSOR
SET UP
PROGRAM
CLOCK
VIDEO
AUDIO
ENTER (SET)
MENU (EXIT)
ENTER
CURSOR
PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE CORRECTION
ENTER (SET)
MENU (EXIT)

PREFERENCE ADJUST

Use this feature to adjust contrast, color, tint, brightness, and sharpness.

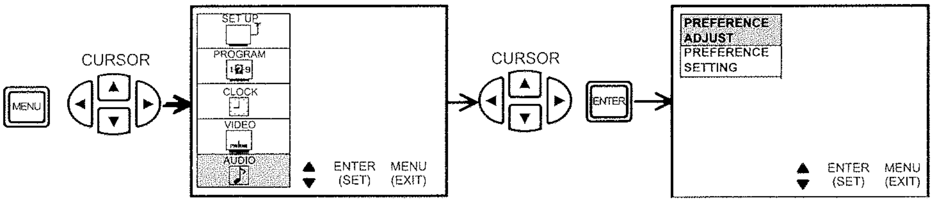

PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE CORRECTION
ENTER (SET)
MENU (EXIT)
ENTER
PREFERENCE ADJUST
CONTRAST
COLOR
TINT
BRIGHT
SHARPNESS
RESET
MENU (EXIT)

Press the CURSOR buttons to select and make adjustments.
The function to be adjusted will be in yellow.

CONTRAST —	Use this function to change the contrast between black and white level in the picture. This adjustment will only affect the picture when the PICTURE SETTING AI is OFF.
COLOR —	Use this function to adjust the level of color in the picture.
TINT —	Use this function to adjust flesh tones so they appear natural.
BRIGHT —	Use this function to adjust overall picture brightness.
SHARPNESS —	Use this function to adjust the amount of fine detail in the picture.
RESET —	When RESET is selected, press ENTER to return video adjustments to factory preset conditions.

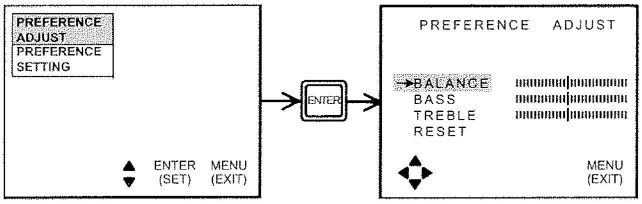
AUDIO

Select AUDIO to adjust the TV to your preference, to improve the sound quality, and to select special sound effects.


MENU
CURSOR
SET UP
PROGRAM
CLOCK
VIDEO
AUDIO
ENTER (SET)
MENU (EXIT)
CURSOR
ENTER
PREFERENCE ADJUST
PREFERENCE SETTING
ENTER (SET)
MENU (EXIT)

PREFERENCE ADJUSTMENT

Use this to set balance, bass, and treble.


PREFERENCE ADJUST
PREFERENCE SETTING
ENTER (SET)
MENU (EXIT)
ENTER
PREFERENCE ADJUST
BALANCE
BASS
TREBLE
RESET
MENU (EXIT)

Press the CURSOR buttons to select and make adjustments.
The function to be adjusted will be in yellow.

BALANCE — This function will control the left to right balance of the TV internal speakers, the AUDIO TO HI-FI output, and the Surround speakers.

BASS — This function controls the low frequency audio to all speakers.

TREBLE — This function controls the high frequency audio to all speakers.

RESET — When RESET is selected, press ENTER to return audio adjustments to factory preset conditions.

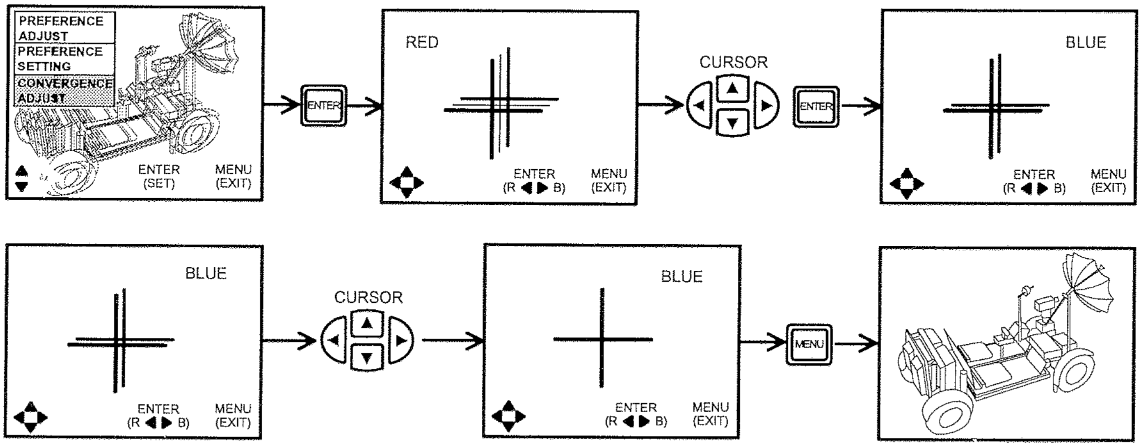
SELF CHECK REPAIR CODES

Press the AVX and POWER buttons on the control panel at the same time.

CODE	DETECTION CONTENTS	DETECTION TIME	REMARK
40	Abnormal deflection circuit	- - -	- - -
41	Abnormal + B line	- - -	- - -
42	Abnormal convergence circuit	- - -	- - -
10	Check for PLL lock	Not locked in 2 sec.	During selection time
11	Check for AFC operation	Not finished in 2 sec.	During selection time
60	Check for AC input	At uP reset time	AC input (50/60Hz) not detected at reset time
31	Check I001 operation	At uP reset time	Check for out of range operation
43	Abnormal signal circuit	- - -	- - -

Note: Code 10 or 11 may appear if TV is turned on without an antenna source connected.

CONVERGENCE ADJUST


PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE ADJUST
ENTER (SET)
MENU (EXIT)
ENTER
RED
ENTER (R ◀ ▶ B)
MENU (EXIT)
CURSOR
ENTER
BLUE
ENTER (R ◀ ▶ B)
MENU (EXIT)
BLUE
ENTER (R ◀ ▶ B)
MENU (EXIT)
CURSOR
BLUE
ENTER (R ◀ ▶ B)
MENU (EXIT)
MENU

Press the CURSOR ▲, ▼ to move the color displayed up or down.
Press the CURSOR ◀, ▶ to move the color displayed left or right.
Press ENTER to change the color.
Press MENU to exit.

CAUTIONS WHEN CONNECTING/DISCONNECTING THE HV CONNECTOR

Perform the following when the HV connector (anode connector) is removed or inserted for CPT replacement, etc.

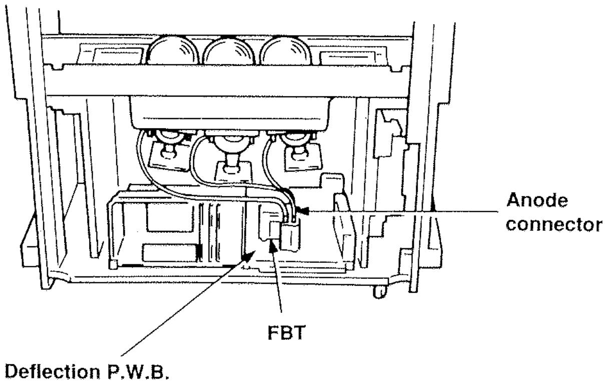

Anode connector
FBT
Deflection P.W.B.

Fig. 5

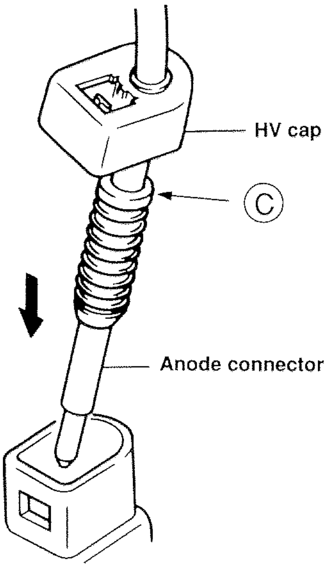

HV cap
Ⓒ
Anode connector

Fig. 7

During Removal

1. Insert a small flat-bladed screwdriver (adjustment screwdriver: 5-7 mm wide and 0.2-0.3 mm thick) into section Ⓐ in Fig. 6 and then push it in the direction of arrow Ⓑ. The lock will release with a click. (The state in Fig. 8 (1) will change to that in Fig. 8 (2).)

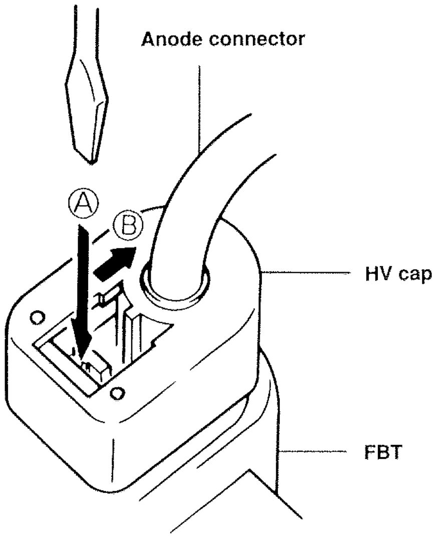
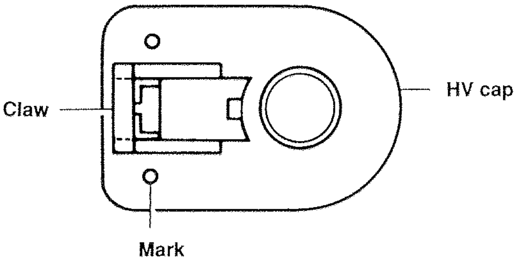

Anode connector
Ⓐ
Ⓑ
HV cap
FBT

Fig. 6

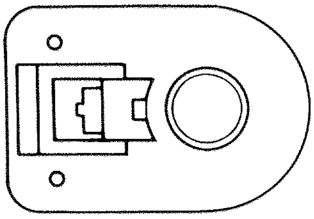
2. Remove the HV cap and remove the anode connector (Fig. 7).

During Insertion

1. Insert the anode connector deep into the FBT (to section Ⓒ in Fig. 7) and then push the HV cap into the FBT until it clicks.
2. Make sure the connector is securely inserted. (Check that the claw is at the mark on the HV cap shown as in Fig. 8 (1).)


Claw
HV cap
Mark

(1) Lock on
(When connector is inserted)



(2) Release
(When connector is removed)

Fig. 8

ADJUSTMENT INSTRUCTION

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1. ASSEMBLED P.W.B. ADJUSTMENT (Surround P.W.B.)

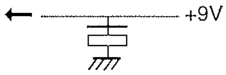
Note: This adjustment is only necessary when replacing the Surround P.W.B. Do not press INITIAL SET for an existing Surround P.W.B. or adjustment data will be lost. (Do not press ENTER)

Preparation for adjustment
MTS demodulating circuit adjustment

(1) Press the "POWER" button while pressing the "VOL DOWN" button to select "MTS ADJ" mode as shown.

MTS ADJUST		
→ INITIAL SET	:	
INPUT LEVEL	:	20
ST VCO	:	20
FILTER	:	3F
SEPARATION (L)	:	20 ·
SEPARATION (H)	:	20
SAP VCO	:	20

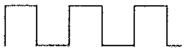
(2) Select the "INITIAL SET" to set each adjust data to initial data.
(3) Apply +9±0. 1V to the point as shown below.
 (1) SU1 connector ⑲ pin (MAXUS)
 (2) FRONTEND (U001) +B
 (3) SU 2 connector ⑭ pin GND



1.1 ST VCO adjustment

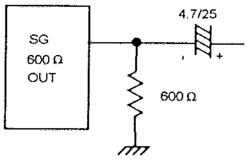
Adjustment preparation
(1) Select the "ST VCO" on "MTS ADJ" model
(2) Connect a frequency counter to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).
Note: Use 1:1 probe
Probe standard Ri≥1MΩ, Ci≤15pF
(3) Input of SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) is no signal.

Adjustment procedure
(1) Adjust the data Set to 15. 734±0. 1kHz of a frequency counter.
Note: Variable range of data: 00~3F (HEX).
Wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).



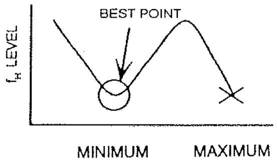
1.2 Filter adjustment

Adjustment preparation
(1) Select the "FILTER" on "MST ADJ" mode.
(2) Apply the signal to SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) with the jig shown.



SU1 connector ⑩ pin
(IW01 ⑦ pin AUDIO-IN)

f=15. 734kHz (Sin wave)
v=100mVrms



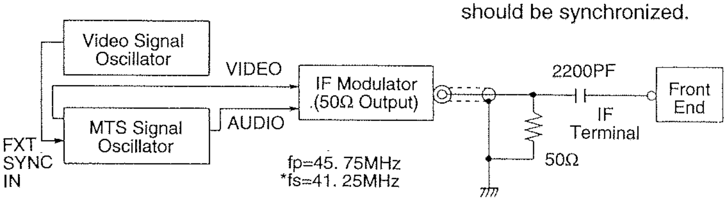
(3) Connect an oscilloscope to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT)

Adjustment procedure
(1) Adjust the data so that the wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT) is minimum as shown above.
Note: Variable range of data: 00~3F (HEX)

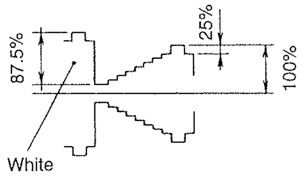
1.3 Input level adjustment

Adjustment preparation
(1) Select the "INPUT LEVEL" on "MTS ADJ" mode.
(2) Apply the signal to F/E IF input terminals of SIGNAL PWB using the jig shown.

Using the jig
*Video signal and audio signal should be synchronized.



IF modulator output signal waveform (Color bar or all white)



IF modulator output level and P/S
P=106dBu (50 ohm termination)
S level: -3dB to p
At this time, S/N ratio of F/E video output is 45dB or less.

Sound Modulation Condition
•Noise reduction encoder : ON
•Stereo signal : ① R=0 (L only), 300Hz, 30% modulation (note)
: ② R=0 (L only), 3KHz, 30% modulation (note)
•Monaural signal : ③ Monaural, 400Hz, 100% modulation (PRE-EN OFF)
•SAP signal : ④ SAP, 300Hz, 30% modulation (note)

Note 1: Use sound modulator with frequency characteristics within +1% during 50Hz~100KHz.
Note 2: Turn off noise reduction (NR), set 30% modulation, then turn (NR) on. Set modulation at audio signal generator output, not IF modulator output.

(3) Connect AC voltmeter to SU1 connector⑦ pin (IW01 ㉖ pin R-OUT)

Adjustment procedure
(1) Select sound input signal 3 and adjust the data set to 500±10mVrms of Vo.
Note: Variable range of data: 00~3F (HEX)

1.4 Separation adjustment

Adjustment preparation
(1) Connect an oscilloscope to SU1 connector (IW01 ㉖ pin R-OUT)
(2) Same as in item 1.3 (2).
(3) Set "MTS" to "STEREO".

Adjustment procedure
(1) Select the "SEPARATION (L)" on "MTS ADJ" mode.
(2) Select sound input signal ① and adjust the data so that 300Hz level is min.
Note: Variable range of data: 00~3F (HEX)
(3) Select the "SEPARATION (H)" ON "MTS ADJ" mode.
(4) Select sound input signal ② and adjust the data so that 3kHz level is min.
Note: Variable range of data: 00~3F (HEX)
(5) Repeat (1) and (4).
Note: •Adjustment precision: within + 1dB from min. point.
•"STEREO" should be displayed on the screen.
•Readjust INPUT LEVEL (1.3) as required.

1.5 SAP VCO adjustment

Adjustment preparation

(1) Select the "SAP VCO" mode.

(2) Connect a frequency counter to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).

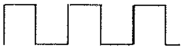
Note: •Use probe 1:1.
•Probe standard Ri≥1MΩ, Ci≤15pF.

(3) Input of SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) is no signal.

Adjustment procedure

(1) Adjust the data set to read 78.67 ±0.5kHz on frequency counter.

Note: •Variable range of data: 00~3F (HEX)
•Wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-out).



1.6 SAP reception check

Adjustment preparation

(1) Same as in item 1.3 (2).

(2) Connect an oscilloscope to SU1 connector (IW01 ㉖ pin R-OUT).

(3) Set "MTS" to "SAP".

Adjustment procedure

(1) Select the audio input signal ①. The output level at this time is represented by VST.

(2) Select the audio input signal ④. Check that the output level at this time is almost the same as VST.
("SAP" should be displayed at this time.)

2. CHASSIS ASSEMBLY ADJUSTMENT (SIGNAL BLOCK)

2.1 Memory initialization

Adjustment preparation

(1) Refer to section 4. ADJUSTMENT POINT to locate the 2-pin PI2 connector, on the signal PWB.

Adjustment procedure

(1) Short the pins for one second, then remove.

(2) A short "beep" will be heard at reset time, and channel "03" will be displayed on the OSD.

Note: The TV will be set to factory shipping conditions. Do not unplug set or press any buttons during this operation.

2.2 Comb filter adjustment

Adjustment preparation

(1) Receive the color bar signal at the regular tuning point.

(2) Connect the oscilloscope to the emitter of Q312.

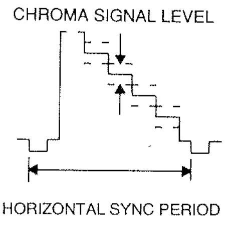
(3) Set the brightness to Max (+31) and set the other controls to typ (0).

(4) Set the AI to OFF.

Adjustment procedure

(1) Check that the residual signal level is 50mVp-p or less.

Note: The chrome signal level is the point shown below.



Note: •Use a 10:1 probe.
•Use an oscilloscope with a 20mV/div resolution.

2.3 Horizontal coarse AFC adjustment (R367)

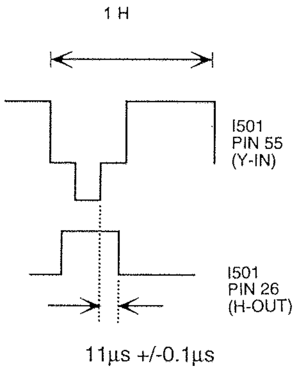
Adjustment preparation

(1) Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)

(2) Connect the oscilloscope to I501 pin (55) (Y-in) and pin ㉖ (Horizontal pulse out).

Adjustment procedure

(1) Adjust R367 (AFC) for 11µs delay between pin (55) and ㉖.



3. FINAL ASSEMBLY ADJUSTMENT

3.1 Optical system adjustment

3.1.1. Focus adjustment

Adjustment preparation

(1) The set can face in any direction, west, east, north or south.

(2) Receive the cross-hatch pattern signal.
CONTRAST: CENTER
BRIGHTNESS: -16 (-8 position shown on the display)

(3) The electrical focus adjustment should have been completed.

(4) The centering DY inclination should have been adjusted.

Adjustment procedure

(1) Loosen the fixing screw on the lens cylinder so that the lens cylinder can be turned. (Be careful not to loosen too much. If it is loosened too much, rattling when tightening becomes greater and the focus may drift.) After completing steps (5), (6) and (7) below, tighten the fixing screws for each lens with a torque of 12-17kg/cm.

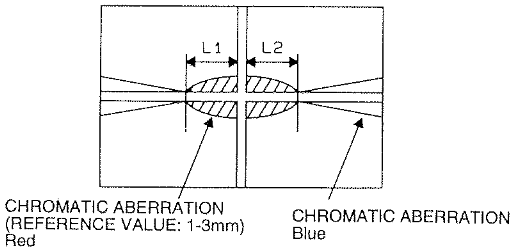
(2) Apply covers to 2 of R, G and B lenses, and project a single color on the screen and adjust in sequence. (The adjustment order of R, G and B is only an example.)

(3) For each of the R, G and B lenses, observe the color aberration generated on the outer circumference of the cross-hatch bright line at the center section ± 3 pitches vertically and horizontally from the center.

(4) If the lens adjustment knob is turned clockwise, viewed from the front, the color aberration changes as follows.

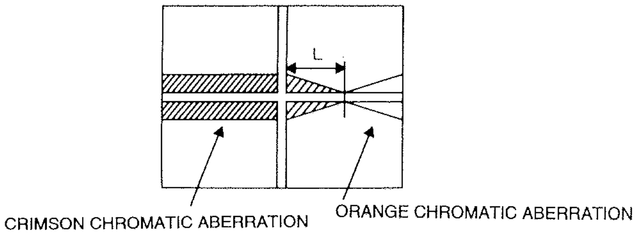
Lens	Change of color aberration
R lens	Orange → Crimson
G lens	Blue → Red
B lens	Purple → Green

(5) In case of G lens, set to the point where the chromatic aberration switches from blue to red. If the chromatic aberration appearing all over the screen is not the same, observe the horizontal bright line at the center of the screen and set to the position where red chromatic aberration slightly appears (reference value: 1-3mm) within the cross-hatch pitches specified in Table below. When the red chromatic aberration appearing at both sides of the bright line is not equal, observe the side with larger chromatic aberration when adjusting.



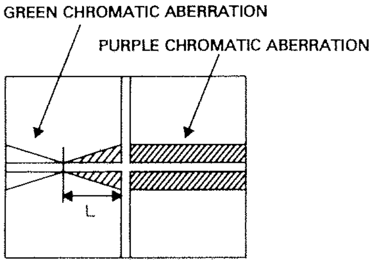
Set Size	Pitch between L1 & L2
50"	4.0 cross-hatch pitches
55"	4.0 cross-hatch pitches

(6) In case of R lens, set to the position where the chromatic aberration changes from orange to crimson.
As shown below, observe the horizontal bright line at the center and set to the position where the crimson chromatic aberration slightly appears (reference value: 1-3mm) within the cross-hatch pitches specified in Table below. Change the signal and fine-adjust in the same way as the G lens.

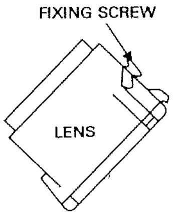


Set Size	Pitch between L
50"	4.0 cross-hatch pitches
55"	4.0 cross-hatch pitches

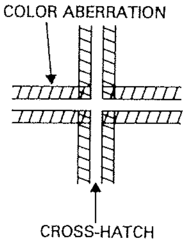
(7) In case of B lens, set to the position where the chromatic aberration changes from purple to green.



Notes: (1) Fixing screw



(2) Color aberration



(3) Since the G light is very important for picture quality and performance, pay special attention in its adjustment.

Note: Be careful not to touch the lens with your fingers when adjusting.

(4) For red, setting to the center between orange and crimson is optimum.

(5) For blue, setting to the center between purple and green is optimum.

3.2 Signal system adjustment

3.2.1. White balance adjustment

(1) Screen adjustment
(2) High brightness white balance
(3) Low brightness white balance

Screen adjustment VRs	Drive adjustment VRs
Red: R804R	Red: R874
Green: R804G	Green: R843
Blue: R804B	

Adjustment preparation

(1) Start adjustment 20 minutes or more after the power is turned on.
(2) The vertical incident illumination on the screen should be 20 lux or less.
(3) Receive the white raster.
(4) Set the drive adjustment VRs (red and green) to their mechanical centers.
(5) Turn the screen adjustment VRs (red, green, blue) fully counter-clockwise.
(6) Set video preference setting white control to warm position.
(7) Set the S301 switch to the front as viewed from the front of the signal P.W.B. (Set to SERVICE side.)

Adjustment procedure

(1) Gradually turn the screen adjustment VRs (red, green, blue) clockwise and set them where the red, green and blue slightly bright lines just appear evenly on the screen.
(2) Return S301 to the NORMAL side.
(3) Set the brightness and black level controls to minimum and turn the sub brightness adjustment VR (R325) and set so that the white raster can be seen slightly.
(4) Set the brightness and black level controls to maximum.
(5) Adjust the high brightness white balance using the drive adjustment VRs (red, green).
(6) Set the brightness to 3ft-L amount or less using the brightness and black level controls.
(7) Adjust the low brightness white balance using the screen adjustment VRs (red, green, blue). (Visually adjust.)
(8) Check that high brightness white balance is obtained.
If it does not, return to step (5).

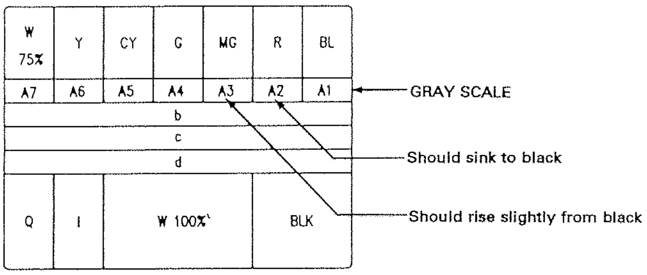
Note: When adjusting the white balance, if the horizontal single raster is to be obtained using S301, check that the screen adjustment VRs are turned fully counterclockwise. Since the phosphorescent surface of the CRT is likely to be burnt, be careful.

White balance: 7500ºK+0MPCD
Color coordinate: X.....0.301
Y.....0.310

3.2.2. Sub brightness adjustment (R325)

Adjustment preparation

(1) Start adjustment 20 minutes or more after the power is turned on. Receive the color bar signal.
(2) Set the contrast and color controls to minimum.
(3) Set the brightness to -6 (-3 position shown on the display).
(4) The vertical incident illumination on the screen should be 20 lux or less.



Adjustment procedure

(1) Adjust so that the points A1 and A2 sink to black and A3 slightly above it rises using the sub brightness adjustment VR (R325).

Note: Directly observe the screen by eye without using a mirror.

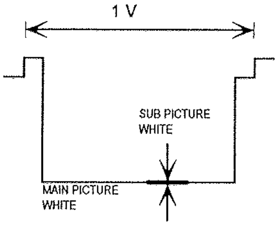
3.2.3. Sub picture adjustment (R506-B, R505-G, R502-R)

Adjustment preparation

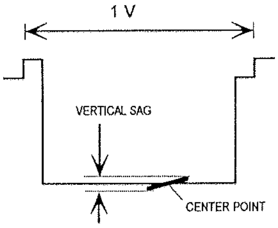
1. Start adjustment after power is on for 20 minutes.
2. Use a white raster signal for adjustment.
3. Press "FREEZE" on the remote control to display the sub picture.
4. Set contrast to center, brightness minimum, AI off.

Adjustment procedure

1. Connect oscilloscope to TP802B and adjust R506 to match blue level of main and sub pictures.
2. Repeat for TP802G and R505 green, TP802R and R502 for red.



Note: If the sub picture has a signal sag, adjust level at center point.



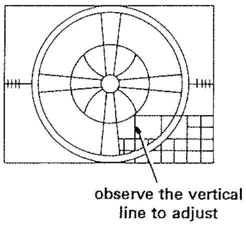
3.2.4. Shoot balance adjustment (R333)

Adjustment preparation

1. Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
2. Set the video condition to factory reset.
3. Turn the shoot balance adjustment VR (R333) fully counter-clockwise.

Adjustment procedure

1. Gradually turn the shoot balance adjustment VR (R333) clockwise and adjust so that the width of pre-shoot and over-shoot of the vertical line (black) shown in the circle pattern are balanced. (Visually adjust.)



Note: Directly observe the screen by eye without using a mirror.

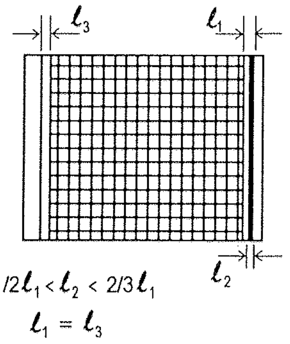
3.2.5. Horizontal AFC adjustment (R367)

Adjustment preparation

1. Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
2. Set CONTRAST to maximum BRIGHTNESS to center.
3. Lens focus should be completed.
4. Electrical focus should be coarse adjusted.
5. Dynamic convergence should be coarse adjusted.
6. Raster inclination should be completed.

Adjustment procedure

1. Project only green color. Cover R & B lenses or short 2P mini connectors on CPT P.W.B.'s.
2. Adjust H-size to minimum. RUL9 fully counterclockwise.
3. Adjust green centering magnet (located on DY) to shift picture left to display edge of raster.
4. Adjust AFC (R367) so foldover of front porch occurs. Amount of foldover is 1/2 to 2/3 of front porch (ℓ_1).



Note:
(1) If raster edge cannot be seen, adjust GH-Pin (RUG9) fully counterclockwise and GH-L-Pin (RUG5) to its mechanical center.
(2) Front and back porch of video should be equal.
(3) If adjustment is difficult with test pattern, follow adjustment 2.3.

3.3.DEFLECTION SYSTEM ADJUSTMENT

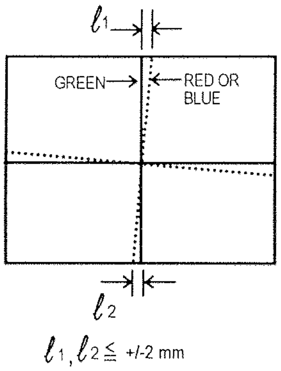
3.3.1. Raster inclination adjustment (Deflection yoke)

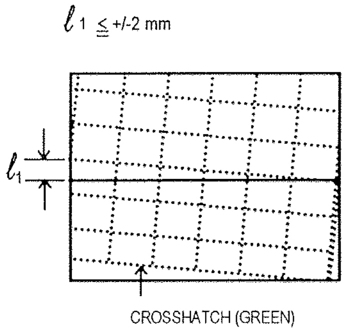
Adjustment preparation

1. The set can face east or west.
2. Input the single cross test signal.
3. CONTRAST: MAX
   BRIGHTNESS: CENTER
4. The lens focus adjustment should have been completed.
5. The electric focus should have been coarse adjusted.
6. The dynamic convergence should have been coarse adjusted. Set the RH-Skew (RU82), BH-Skew (RUE3), RV-Skew (RU25), BV-Skew (RU53), GV-Center (RUN5), GH-Center (RUN9), BV-Center (RUP4), BH-Center (RUP8), RV-Center (RUQ3), and RH-Center (RUQ7) adjustment VRs to their mechanical centers.
7. Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure

1. Apply covers to the R and B lenses and project only green light.
2. Turn the G deflection yoke and adjust the vertical raster inclination.
3. Then, remove the cover of R or B lens and project red or blue light and green light together on the screen.
4. Turn the deflection yoke of R or B and set so that the inclination of R or B with respect to the green light is as shown below on the top and bottom sides.
5. After raster inclination adjustment, fixing screw of DY should be screwed with 12±2 kg•cm torque.





3.3.2. Raster position adjustment

Adjustment preparation

(1) The same as item 3.3.1. (1)~(7).
(2) The raster inclination adjustment should have been completed.
(3) Horizontal AFC adjustment should have been completed.
(4) Apply marking using the tape, etc. at the positions on the screen as shown in Fig. 3-3-2.

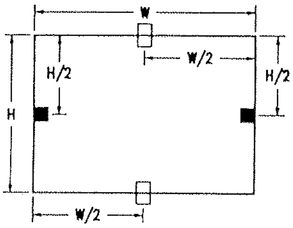


Fig. 3-3-2.

Adjustment procedure

(1) Apply covers to the R lens and B lens, and project only green light on the screen.
(2) Use the green centering magnet and adjust so that the vertical and horizontal lines of the cross pattern match the position where the markings have been applied.
(3) Then remove the cover of R lens or B lens, and project the red or blue light and green light on the screen.
(4) Turn the R or B centering magnet to match the color with the green light.

Note: (1) Spec for green centering vertical direction ±3mm horizontal direction ±2.5mm.
(2) Center of test pattern with respect to geometrical center of screen:
horizontal within 30mm, vertical within 20mm
(3) Red and Blue centering with respect to green is ±2mm in both horizontal and vertical directions.

3.3.3. Pincushion distortion and keystone distortion correction

Adjustment preparation

(1) The screen can face any direction, north, south, east and west.
(2) Display the cross-hatch pattern signal.
(3) The focus adjustment of the G lens should have been completed.
(4) The G raster (deflection yoke) inclination should have been adjusted.
(5) The vertical amplitude and horizontal amplitude should have been coarse adjusted.
(6) Set the GV-Center (RUN5) and GH-Center (RUN9) adjustment VRs to their mechanical centers.

Adjustment procedure

(1) Project only G on the screen using any one of following procedures.
  a. Apply covers to the R and B lenses.
  b. Short-circuit 2P sub mini connectors plug pins of the R and B CPT P.W.B.
(2) Adjust the horizontal line of the G according to the procedure shown in Table 3-1.
(3) Adjust the vertical line of the G according to the procedure shown in Table 3-2.

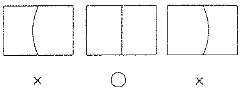
Note: (1) The positions of the adjustment VRs are shown in Fig. 3-4-4. The movement of the bright line corresponding to each VR is shown in Fig. 3-4-3.
(2) After this adjustment, check the raster position, vertical amplitude and horizontal amplitude of the G and adjust finally.

Table 3-1. The pincushion and keystone distortion correction of the horizontal green line (refer to Figs. 3-4-3 and 3-4-4).

No.	Adjustment Item		Adj. VR	Adjustment Details
1	Lower horizontal line	Upper/lower pincushion distortion GV-PIN	RUF2	Correct the bow distortion of the lower horizontal line and make it a straight line.
2		Upper/lower keystone distortion GV-KEY	RUG1	Remove the inclination of the lower horizontal line.
3	Upper horizontal line	Upper pincushion distortion GV-U-PIN	RUE7	Correct the bow distortion of the upper horizontal line and make it a straight line.
4		Upper keystone distortion GV-U-KEY	RUF6	Remove the inclination of the upper horizontal line.

Note 1. Adjustment procedure of the horizontal line (1) Lower line (RUF2/RUG1) and then (2) Upper line (RUE7/RUF6).
Note 2. Adjust repeatedly as occasion demands.

Table 3-2. The pincushion and keystone distortion correction of the vertical green line (refer to Figs. 3-4-3 and 3-4-4).

No.	Adjustment Item		Adj. VR	Adjustment Details
1	Center vertical line	Left/right pincushion distortion phase GV-PIN-PHASE	RT26	(1) Approximately correct the bow distortion at both the left and right sides using GH-PIN (RUG9) and GH-L-PIN (RUG5). (2) Turn RT26 to correct the bow distortion of the center vertical line and to make it a straight line.  × ○ ×
2	Right vertical line	Left/right pincushion distortion GH-PIN	RUG9	Correct the bow distortion of the right side vertical line and make it a straight line.
3		Left/right keystone distortion GH-KEY	RUH8	Remove the inclination of the vertical line on the right side.
4	Left side vertical line	Left pincushion distortion GH-L-PIN	RUG5	Correct the bow distortion of the left side vertical line and make it a straight line.
5		Left keystone distortion GH-L-KEY	RUH4	Remove the inclination of the vertical line on the left side.

Note 1. Adjustment procedure of the vertical line (1) Phase (RT26), (2) Lines on right (RUG9/RUH8), and then left side (RUG5/RUH4).
Note 2. Adjust repeatedly as occasion demands.

3.3.4 Size adjustment

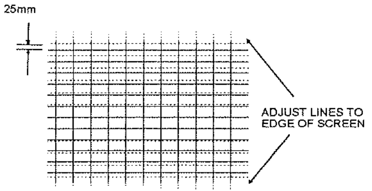
3.3.4.1. Vertical amplitude adjustment (RUN3)

Adjustment preparation

(1) Start adjustment more than 20 minutes after the power is turned on.
(2) The pincushion distortion and the keystone distortion adjustment should have been completed.
(3) Receive the crosshatch signal.
(4) Set the contrast control to maximum and brightness control to center.
(5) Apply cover to the R and B lenses or short-circuit the 2P sub-mini plug pins on the R and B CPT P.W.B. and project only Green on the screen.
(6) Set the GV-Center (RUN5) and GH-Center (RUN9) adjustment VRs to their mechanical center.

Adjustment procedure

(1) Adjust RUN3 so that top and bottom edge of crosshatch touch top and bottom edge of screen frame.
(2) Note the position of the first horizontal crosshatch line.
(3) Increase V size so that the horizontal line moves up 25mm.



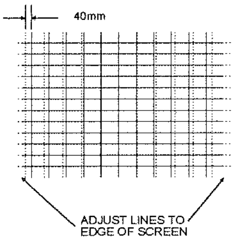
3.3.4.2. Horizontal amplitude adjustment (RUL9)

Adjustment preparation

(1) The same as items 3-3-4-1 (1)-(6).

Adjustment procedure

(1) Adjust RUL9 so that left and right edge of crosshatch touch left and right edge of screen frame.
(2) Note position of first vertical crosshatch line.
(3) Increase H size (RUL9) so that the vertical line moves to the left 40mm.



3.3.5 Focus adjustment

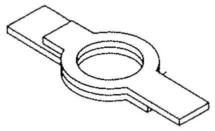
3.3.5.1. Beam alignment

Adjustment preparation

(1) Adjust at least 30 minutes after turning on power switch.
(2) The static convergence data should be cleared (see section 2.1 Memory initialization).
(3) Raster inclination, centering, horizontal and vertical amplitudes and optical focus adjustment should be completed.
(4) Contrast: Max.
Other items: Typ.
(5) Receive cross-hatch signals. (Use of internal cross-hatch signals allowed.)
(6) Short-circuit all metal parts (metal fittings, centering magnet) installed on the projection tubes to GNDs of the projection tubes.
Since metal parts are charged with electricity, shocks may be caused if they are not short-circuited.

Adjustment procedure

(1) Green (G) tube beam alignment adjustment. Short-circuit 2P subminiature connector plug pins of Red (R) and Blue (B) on the CPT boards and project only Green (G) tube.
(2) Put Green (G) tube beam alignment magnet to the cancel state as shown below.



(3) Turn the Green (G) static focus (Focus Pack) counterclockwise all the way and make sure of position of cross-hatch center on screen. (Halo state.)
(4) Turn Green (G) static focus (Focus Pack) clockwise all the way. (Blooming state.)
(5) Turn two magnets forming alignment magnet in any desired direction and move cross-hatch center to position found in (3).
(6) If image position does not shift when Green (G) static focus (Focus Pack) is turned, Green (G) beam alignment has been completed.
(7) If image position shifts when Green (G) statis focus (Focus Pack) is turned, repeat (2)-(6).
(8) Conduct beam alignment for Red (R) focus: Focus Pack EFPK Blue (B) focus: Focus Pack EFPK
(9) Upon completion of adjustment, fix beam alignment magnets with white paint.

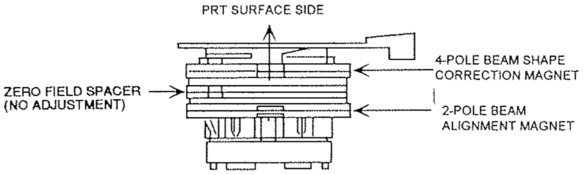
3.3.5.2. Beam shape adjustment

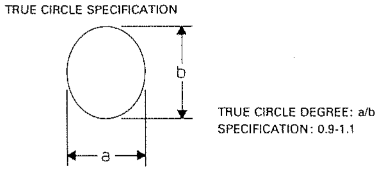
Adjustment preparation

(1) The beam alignment should have been completed.
(2) The raster inclination, centering, horizontal/vertical amplitude and optical focus adjustments should have been completed.
(3) Contrast: Max
Other time: Typ.
(4) Input the dot signal.

Adjustment procedure

(1) Green PRT beam shape adjustment. Short-circuit 2P submini connectors on Red and Blue CPT P.W.B.s to project only the Green beam.
(2) Turn the green static focus fully clockwise. (Blooming.)
(3) Make the dot at the screen center a true circle using the 4-pole magnet as shown below.
(4) Also adjust the Red and Blue PRT beam shapes according to the steps (1) to (3).
(5) After the adjustment is completed, return R, G and B static VRs to the Just focus point.


PRT SURFACE SIDE
4-POLE BEAM SHAPE CORRECTION MAGNET
ZERO FIELD SPACER (NO ADJUSTMENT)
2-POLE BEAM ALIGNMENT MAGNET



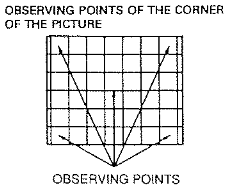
3.3.5.3. Static focus adjustment

Adjustment preparation

(1) The raster inclination, centering, horizontal/vertical amplitude and optical/electrical focus beam alignment should have been adjusted.
(2) The static convergence data should be cleared.
(3) Contrast: More than MAX-5 STEP
Brightness: Center (Reset point)
(4) Receive the cross-hatch pattern signal.
(5) Apply covers to the lenses of colors other than the color to be adjusted and project a single color.

Adjustment procedure

(1) Red (R), Green (G) and Blue (B) static focus adjustment. Vary the static focus VR (focus pack EFPK) and make the center of the cross-hatch pattern clearest.
(2) Observe the corners of the picture and check that the focus does not get conspicuously worse.



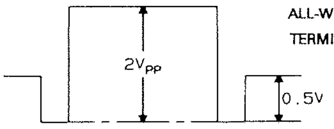
3.3.6. Blue defocus adjustment

Adjustment preparation

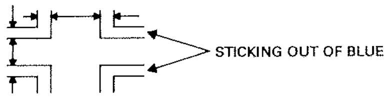
1. Optical and electrical focus adjustment should have been completed.
2. The convergence adjustment should have been completed. Coarse-adjustment is acceptable for convergence.
3. Brightness: Max.
   Other items: Typ.

Adjustment procedure

1. Input an all-white signal shown below to VIDEO input.
2. Short-circuit 2P sub-mini connectors on the red and green CPT P.W.B.s to display only the blue beam.
3. Turn the B static (Focus Pack) fully clockwise.
4. Measure the brightness at the center of the screen and turn the B static (Focus Pack) counterclockwise to adjust the brightness of blue as shown in Table below.
5. After the adjustment is completed, if blue exceeds the specification, turn and adjust focus so that the sticking out part of blue satisfies the specification.



ALL-WHITE SIGNAL WAVEFORM
TERMINATION CONDITION: OPEN



UNEVENNESS SPECIFICATION: ±1cd/m²

Defocus brightness specification

Screen Size	Brightness of Blue
50"	37 cd/m²
55"	30 cd/m²

Defocus sticking out specification

Screen Size	Blue sticking out
50"	2.0 mm
55"	2.0 mm

Condition: User controls are set to the initial set positions (for shipment) Measuring point Screen center.

Cautions: Correct the brightness gauge and amplitude of the all-white signal periodically. The aperture angle of the brightness gauge is 1°.
Use a cross-hatch pattern to check.

3.4. CONVERGENCE ADJUSTMENT

3.4.1. Static convergence adjustment

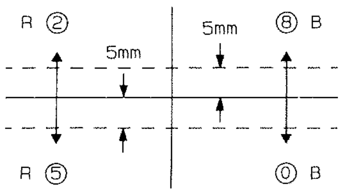
Adjustment preparation

1. The screen can face east or west.
2. Display the cross pattern signal or the cross-hatch pattern signal.
3. R, G and B lens focus adjustment and R, G and B raster inclination adjustment should have been completed.
4. G raster position adjustment, pincushion distortion, and keystone distortion adjustments should have been completed.
5. R and B raster position (centering magnet) adjustment should have been completed.
6. The dynamic convergence should have been coarse adjusted previously.

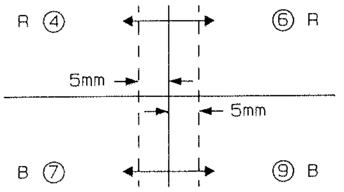
Adjustment procedure

1. Set to CONVERGENCE mode using the MENU and CURSOR buttons of the remote control.
2. Check that the variable range of the static convergence adjustment is obtained as shown below using the cursor buttons of the remote control transmitter.

(3) RV, BV



RH, BH



If the adjustment cannot be done, turn the centering magnets for R and B and re-adjust the R and B raster position.

Note: (1) Refer to page 14 for static convergence adjustment.
(2) Return TV set to normal mode by pressing the MENU button on the remote control.
(3) Static convergence is set to standard mode during memory initialization.

3.4.2. Dynamic convergence adjustment

Adjustment preparation

1. The screen can face any direction, north, south, east and west.
2. Start adjustment 20 minutes or more after the power switch is turned on.
3. Display the cross-hatch pattern signal.
4. The following adjustments should have been completed for R, G and B.
   (a) Lens focus
   (b) Raster (deflection yoke) inclination
   (c) Raster position
5. The following adjustments should have been completed for the G raster.
   (a) Pincushion distortion
   (b) Keystone distortion
   (c) Vertical amplitude
   (d) Horizontal amplitude
6. Horizontal AFC adjustment should be completed.
7. Contrast: Max., Brightness: Center
8. Static convergence should be set to standard mode (memory initialization).

Adjustment procedure

1. R adjustment - Match the R with the G following the procedure shown in Tables 3-4-1 and 3-4-2. At the same time, perform the static convergence adjustment of R.
2. B adjustment - Match the B with the G following the procedure shown in Tables 3-4-1 and 3-4-2. At the same time, perform the static convergence adjustment of B.
3. Adjust repeatedly so that the amount of misconvergence of all colors is minimized.
   (a) If convergence of the vertical line at the right end is drifted, match it using RUJ3 (red) or RUK2 (blue).
   (b) If convergence of the vertical line at the left end is drifted, match it using RUJ7 (red) or RUK6 (blue).
4. After adjustment, re-adjust R and B raster position.
5. After the static convergence adjustment and dynamic convergence adjustment are completed, fix the centering magnet (located on the R and B deflection yokes) using white paint.

Note: (1) When adjusting the R, turn off the B using any one of the following procedures as required.
(a) short-circuit the 2P subminiature connector plug pins on the B CPT P.W.B.
(b) Apply cover to the B lens.
(2) When adjusting the B, turn off the R using any one of the following procedures as required.
(a) short-circuit the 2P subminiature connector plug pins on the R CPT P.W.B.
(b) Apply cover to the R lens.
(3) The position of VRs and the movement of the bright lines are shown in Fig. 3-4-3 and Fig. 3-4-4.

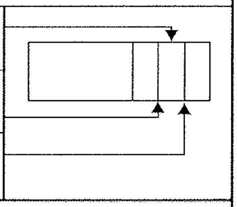
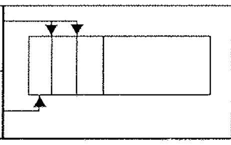
Table 3-4-1. Dynamic convergence adjustment of the horizontal line (RED/BLUE)

No.	Adjustment Item		Adj. VR		Adjustment Details
			RED	BLUE	
1	Horizontal center line	Vertical skew V-SKEW	RU25	RU53	Remove the inclination of the horizontal center line.
2		Vertical bow V-BOW	RU23	RU51	Correct the bow distortion of the horizontal center line and make it a straight line.
3	Lower horizontal line	Upper/lower pincushion distortion V-PIN	RU05	RU33	Correct the bow distortion of the lower horizontal line and make it a straight line.
4		Upper/lower keystone distortion V-KEY	RU13	RU41	Remove the inclination of the lower horizontal line.
5	Upper horizontal line	Upper pincushion distortion V-U-PIN	RU01	RU29	Correct the bow distortion of the upper horizontal line and make it a straight line.
6		Upper keystone distortion V-U-KEY	RU09	RU37	Remove the inclination of the upper horizontal line.
7	Upper/lower horizontal line	Vertical size V-SIZE	RU19	RU47	Match upper/lower horizontal line with the green line by changing the vertical size.
8		Vertical linearity V-LIN	RU17	RU45	Match upper/lower horizontal line with the green line by changing the linearity.

Note:

1. Adjustment procedure of the horizontal lines (1) Center, (2) Lower, (3) Upper and then (4) Upper/Lower.
2. Accurately match the horizontal center lines (red/blue) with the green line using the centering magnets (item 3-3-2).
3. The adjustment VRs shown in items 7 and 8 of above table (RU19, RU47, RU17, RU45) as well as BV-Center (RUP4), BH-Center (RUP8), RV-Center (RUQ3), and RH-Center (RUQ7), should have been set to their mechanical centers previously.

Table 3-4-2. Dynamic convergence adjustment of the vertical line (RED/BLUE)

No.	Adjustment Item		Adj. VR		Adjustment Details	
			RED	BLUE		
1	Vertical center line	Horizontal skew H-SKEW	RU82	RUE3	Remove the inclination of the vertical center line.	
2		Horizontal bow H-BOW	RU80	RUE1	Correct the bow distortion of the vertical center line and make it a straight line.	
3	Right side vertical line	Left/right pincushion distortion H-PIN	RU61	RU90	Correct the bow distortion of the right side vertical line and make it a straight line.	
4		Left/right keystone distortion H-KEY	RU69	RU98	Remove the inclination of the right side vertical line.	
5		Horizontal size H-SIZE	RU76	RUA6	Extend 2nd vertical line from the left/right side.	
6		Horizontal linearity H-LIN	RU73	RUA3	Match 2nd vertical line from the right end with green line.	
7		Right end line linearity H-R-LIN	RUJ3	RUK2	Match right end line with the green line.	
8	Left side vertical line	Left pincushion distortion H-L-PIN	RU57	RU86	Correct the bow distortion of the left side vertical line and make it a straight line.	
9		Left keystone distortion H-L-KEY	RU65	RU94	Remove the inclination of the vertical line on the left side.	
10		Left horizontal size H-L-SIZE	RUL1	RUL5	Match left side vertical line with the green line.	
11		Left end line linearity H-L-LIN	RUJ7	RUK6	Match left end vertical line with the green line.	

Note:

1. Adjustment procedure of the vertical lines (1) Center, (2) Right, and then (3) Left line.
2. Accurately match the vertical center lines (red/blue) with the green line using the centering magnets (item 3-3-2).
3. The adjustment VRs shown in items 5, 6, 7, 10 and 11 (RU76, RUA6, RU73, RUA3, RUJ3, RUK2, RUL1, RUL5, RUJ7 and RUK6) as well as RH-Center (RUQ7) and BH-Center (RUP8), should have been set to their mechanical centers previously.
4. Including centering magnets, adjust repeatedly as required.

MOVEMENT OF THE BRIGHT LINE
(This shows the movement of the bright line corresponding to the adjustment VR.)

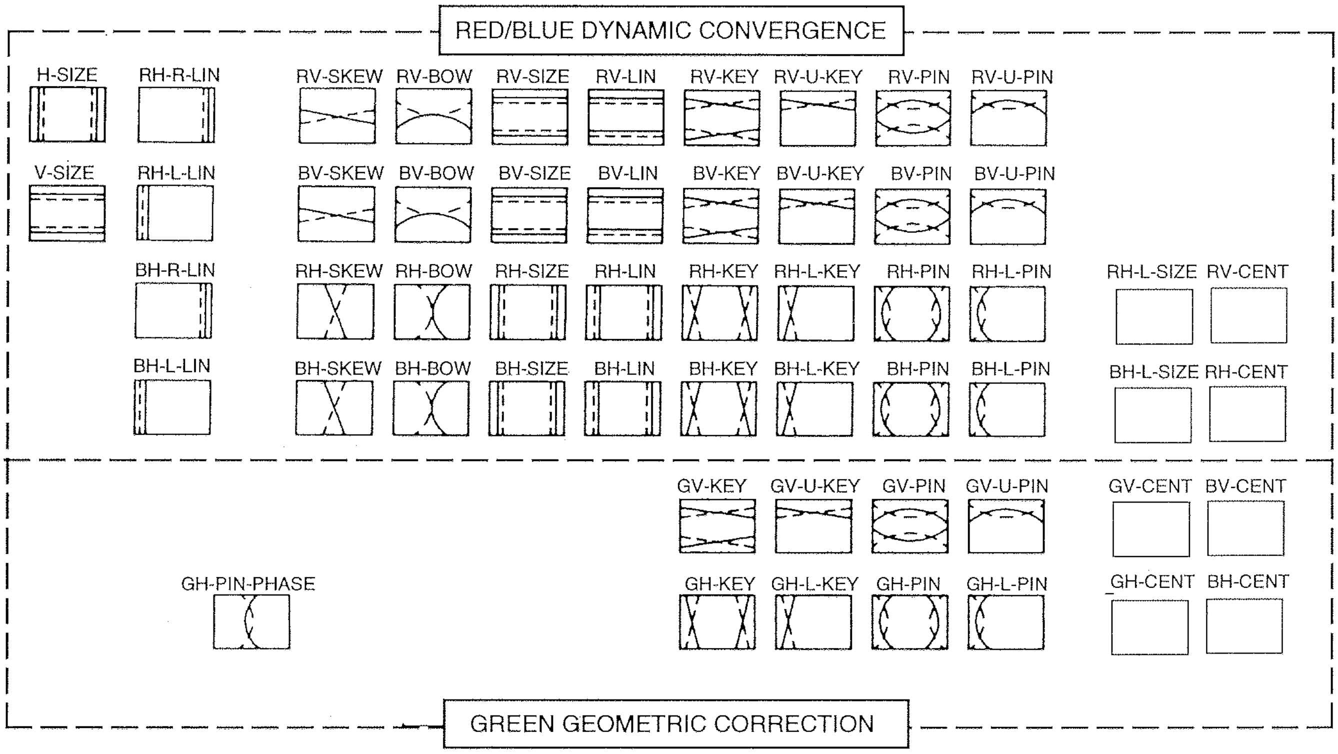

RED/BLUE DYNAMIC CONVERGENCE
H-SIZE
RH-R-LIN
RV-SKEW
RV-BOW
RV-SIZE
RV-LIN
RV-KEY
RV-U-KEY
RV-PIN
RV-U-PIN
V-SIZE
RH-L-LIN
BV-SKEW
BV-BOW
BV-SIZE
BV-LIN
BV-KEY
BV-U-KEY
BV-PIN
BV-U-PIN
BH-R-LIN
RH-SKEW
RH-BOW
RH-SIZE
RH-LIN
RH-KEY
RH-L-KEY
RH-PIN
RH-L-PIN
RH-L-SIZE
RV-CENT
BH-L-LIN
BH-SKEW
BH-BOW
BH-SIZE
BH-LIN
BH-KEY
BH-L-KEY
BH-PIN
BH-L-PIN
BH-L-SIZE
RH-CENT
GV-KEY
GV-U-KEY
GV-PIN
GV-U-PIN
GV-CENT
BV-CENT
GH-PIN-PHASE
GH-KEY
GH-L-KEY
GH-PIN
GH-L-PIN
GH-CENT
BH-CENT
GREEN GEOMETRIC CORRECTION

Fig. 3-4-3

LAYOUT OF THE ADJUSTMENT VR

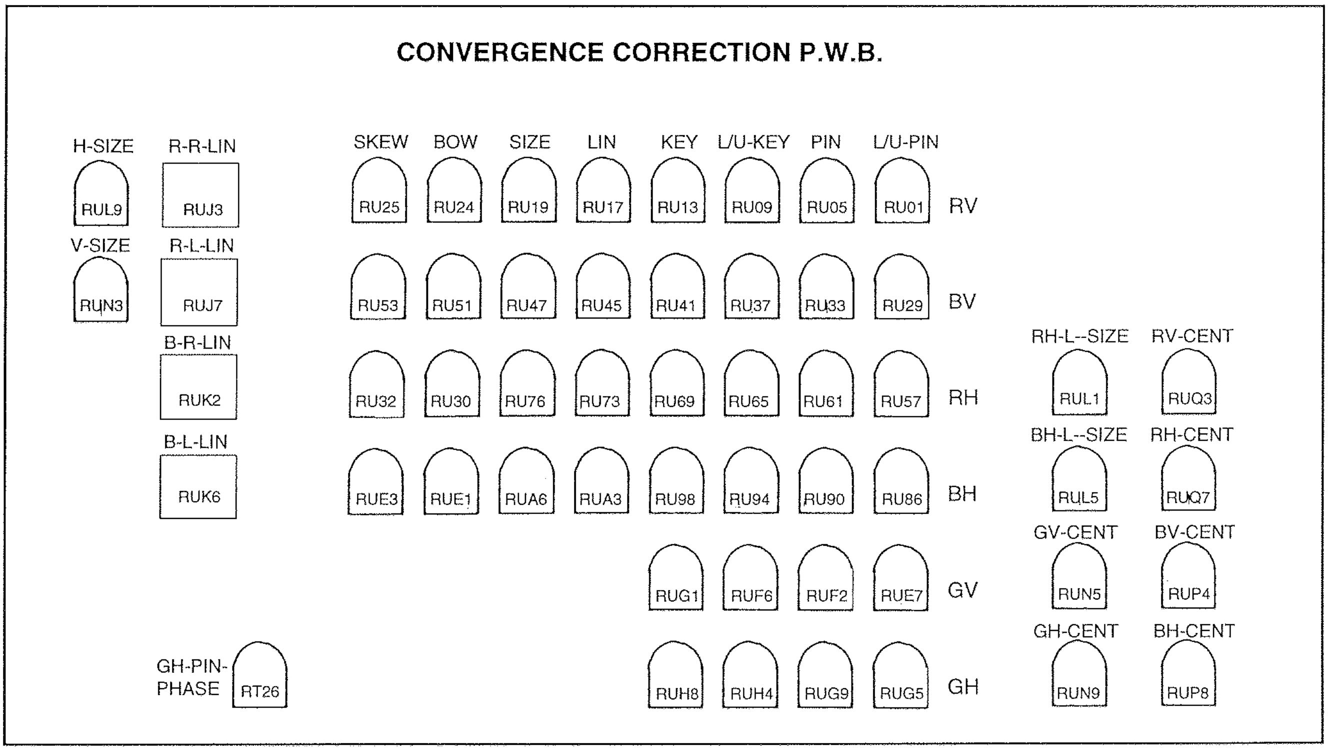
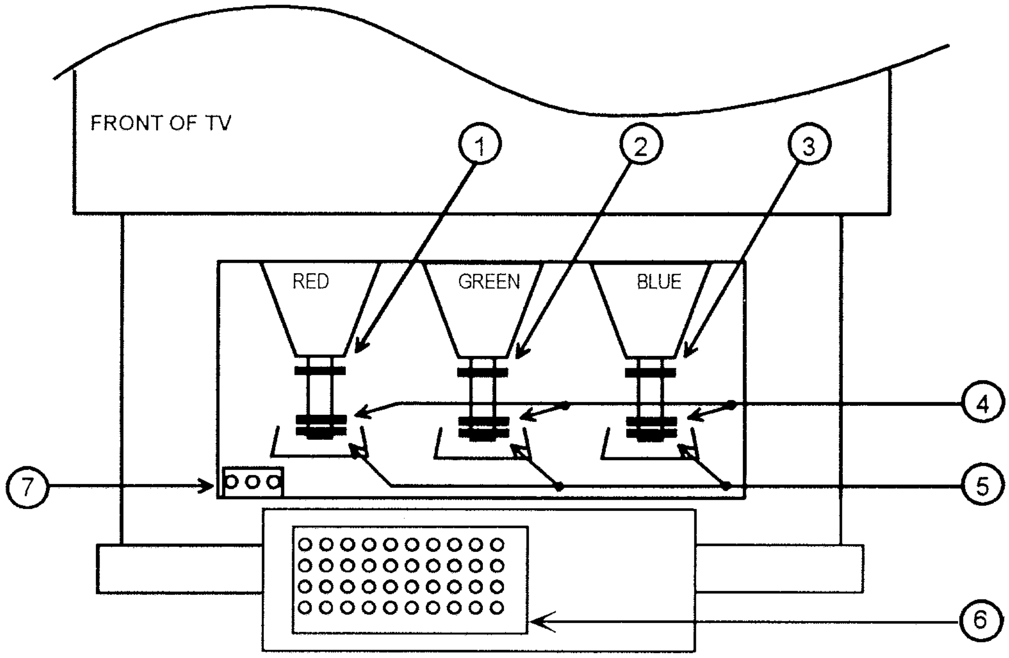

CONVERGENCE CORRECTION P.W.B.
H-SIZE
RUL9
R-R-LIN
RUJ3
V-SIZE
RUN3
R-L-LIN
RUJ7
B-R-LIN
RUK2
B-L-LIN
RUK6
SKEW
BOW
SIZE
LIN
KEY
L/U-KEY
PIN
L/U-PIN
RU25
RU24
RU19
RU17
RU13
RU09
RU05
RU01
RV
RU53
RU51
RU47
RU45
RU41
RU37
RU33
RU29
BV
RU32
RU30
RU76
RU73
RU69
RU65
RU61
RU57
RH
RUE3
RUE1
RUA6
RUA3
RU98
RU94
RU90
RU86
BH
RUG1
RUF6
RUF2
RUE7
GV
RUH8
RUH4
RUG9
RUG5
GH
GH-PIN-PHASE
RT26
RH-L--SIZE
RUL1
RV-CENT
RUQ3
BH-L--SIZE
RUL5
RH-CENT
RUQ7
GV-CENT
RUN5
BV-CENT
RUP4
GH-CENT
RUN9
BH-CENT
RUP8

Fig. 3-4-4

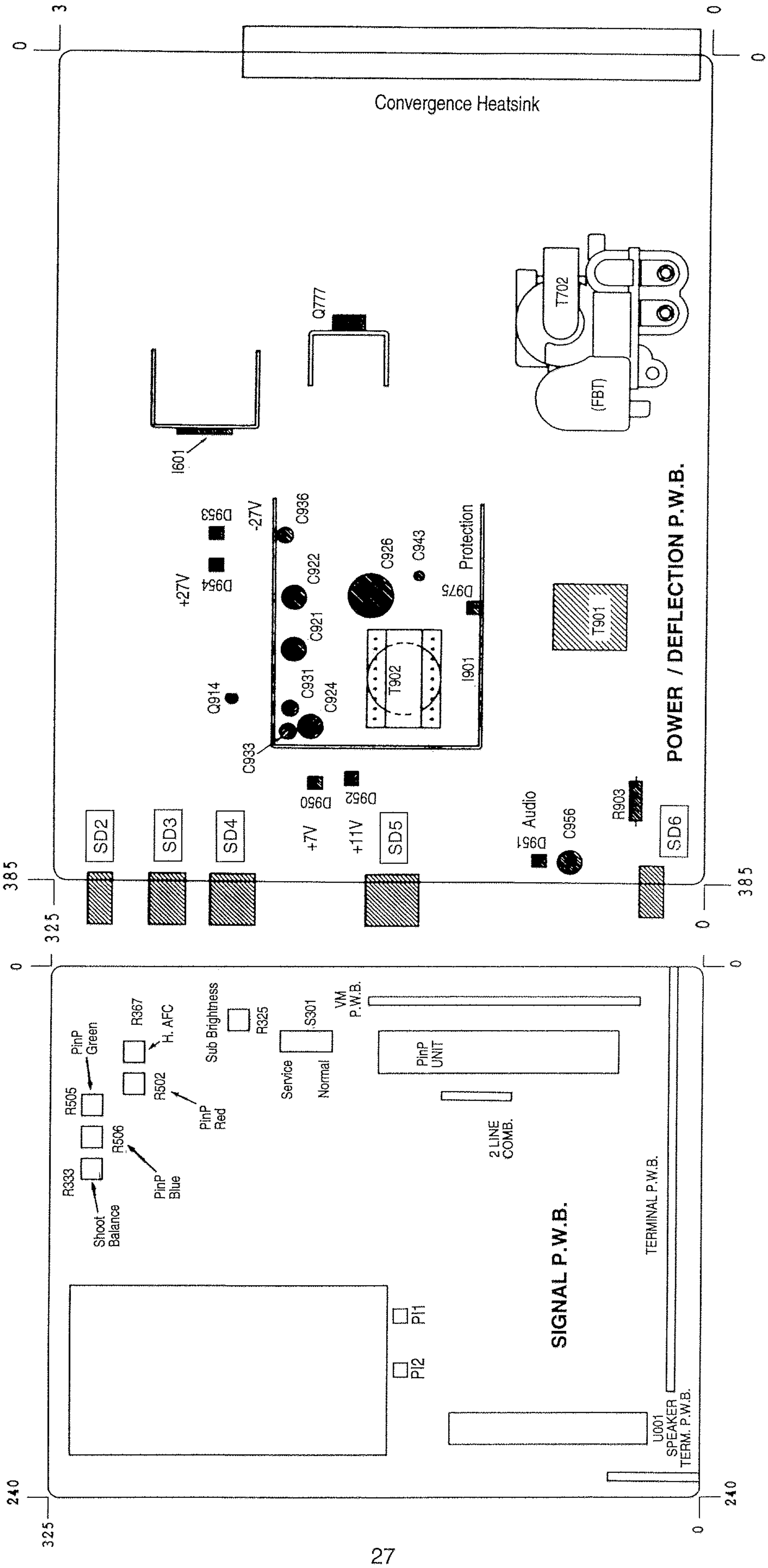
4. ADJUSTMENT POINT

4.1. CRT, cabinet locations

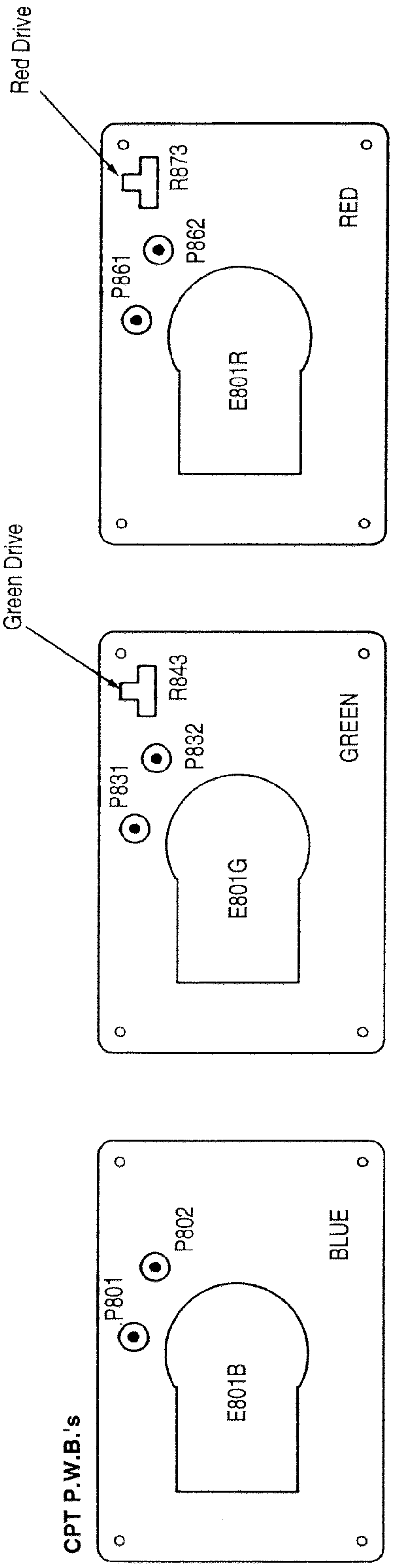


1. CENTERING MAGNET FOR RED PRT
2. CENTERING MAGNET FOR GREEN PRT
3. CENTERING MAGNET FOR BLUE PRT
4. 4-POLE MAGNET FOR BEAM FORM ADJUSTMENT
5. BEAM ALIGNMENT MAGNET
6. CONVERGENCE CORRECTION P.W.B.
7. FOCUS PACK (TOP ADJUSTMENTS FOR FOCUS, BOTTOM FOR SCREEN)

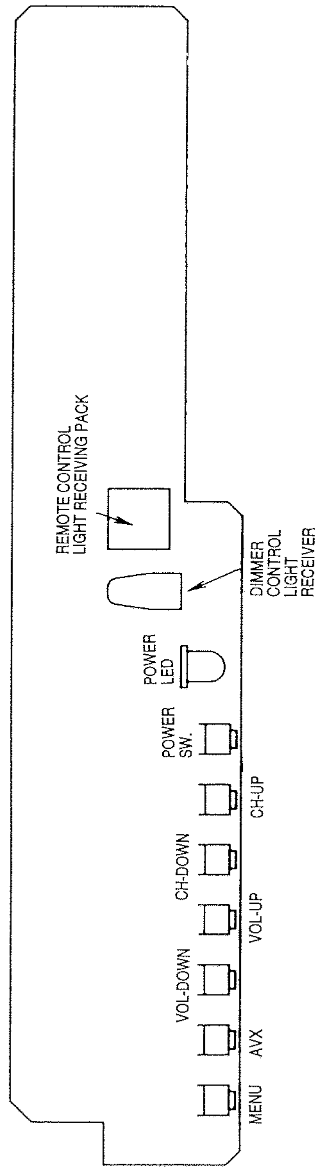
4.2. Signal P.W.B., Power/Deflection P.W.B. adjustment points


0
3
0
0
Convergence Heatsink
Q777
T702
(FBT)
I601
D953
-27V
C936
D954
+27V
C922
C926
C943
Protection
D975
T901
C921
Q914
C931
C924
T902
I901
POWER / DEFLECTION P.W.B.
C933
D950
D952
SD2
SD3
SD4
+7V
+11V
SD5
Audio
D951
C956
R903
SD6
385
325
385
0
0
0
PinP Green
R367
H. AFC
Sub Brightness
R325
S301
VM P.W.B.
R505
R502
Service
Normal
PinP UNIT
PinP Red
R506
R333
2 LINE COMB.
PinP Blue
Shoot Balance
SIGNAL P.W.B.
TERMINAL P.W.B.
PI1
PI2
U001 SPEAKER TERM. P.W.B.
240
325
240
0

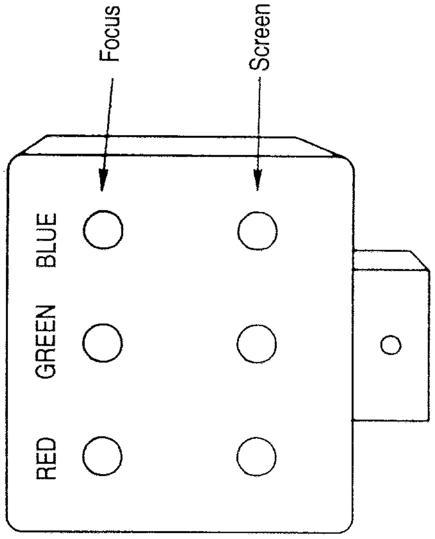
4.3. CPT, Control P.W.B., Focus Pack adjustment points


Red Drive
R873
P862
P861
RED
E801R
Green Drive
R843
P832
P831
GREEN
E801G
P802
P801
BLUE
E801B

CPT P.W.B.'s


REMOTE CONTROL LIGHT RECEIVING PACK
DIMMER CONTROL LIGHT RECEIVER
POWER LED
POWER SW.
CH-UP
CH-DOWN
VOL-UP
VOL-DOWN
AVX
MENU

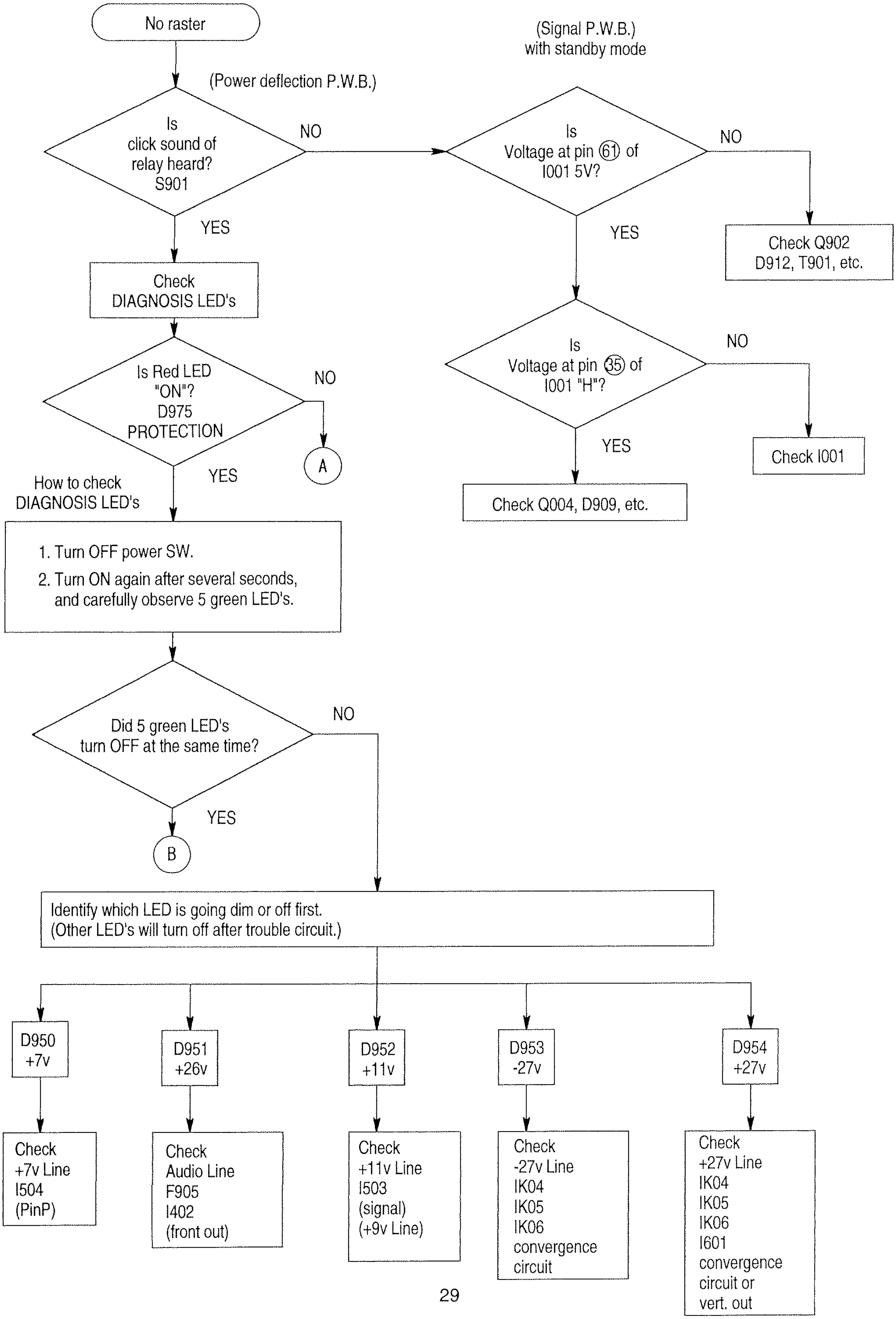
CONTROL P.W.B.


Focus
Screen
BLUE
GREEN
RED

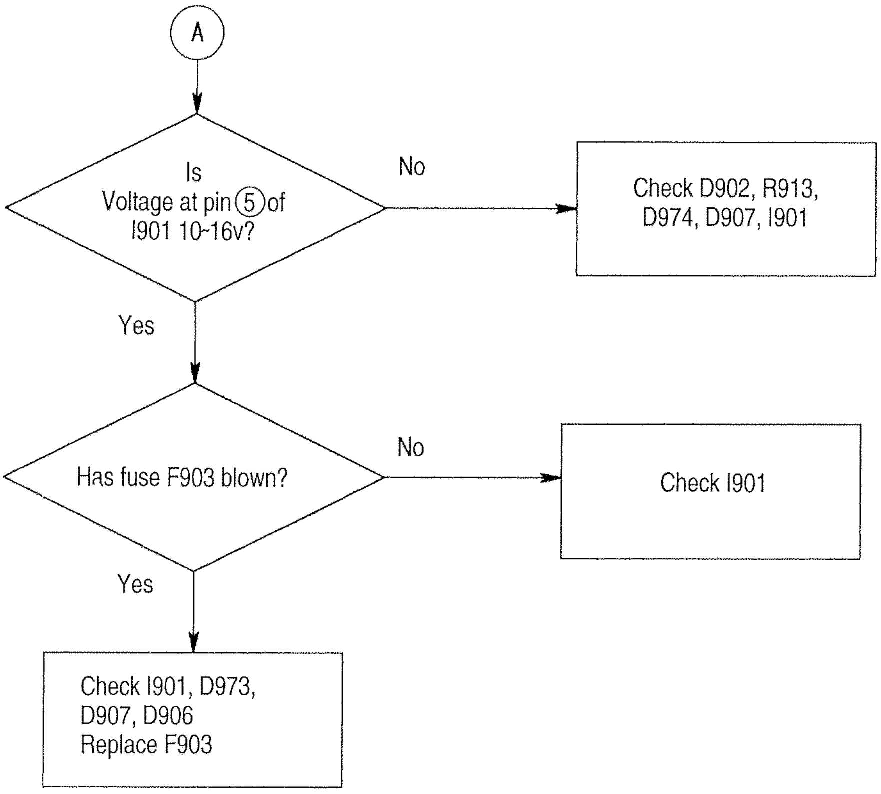
FOCUS PACK

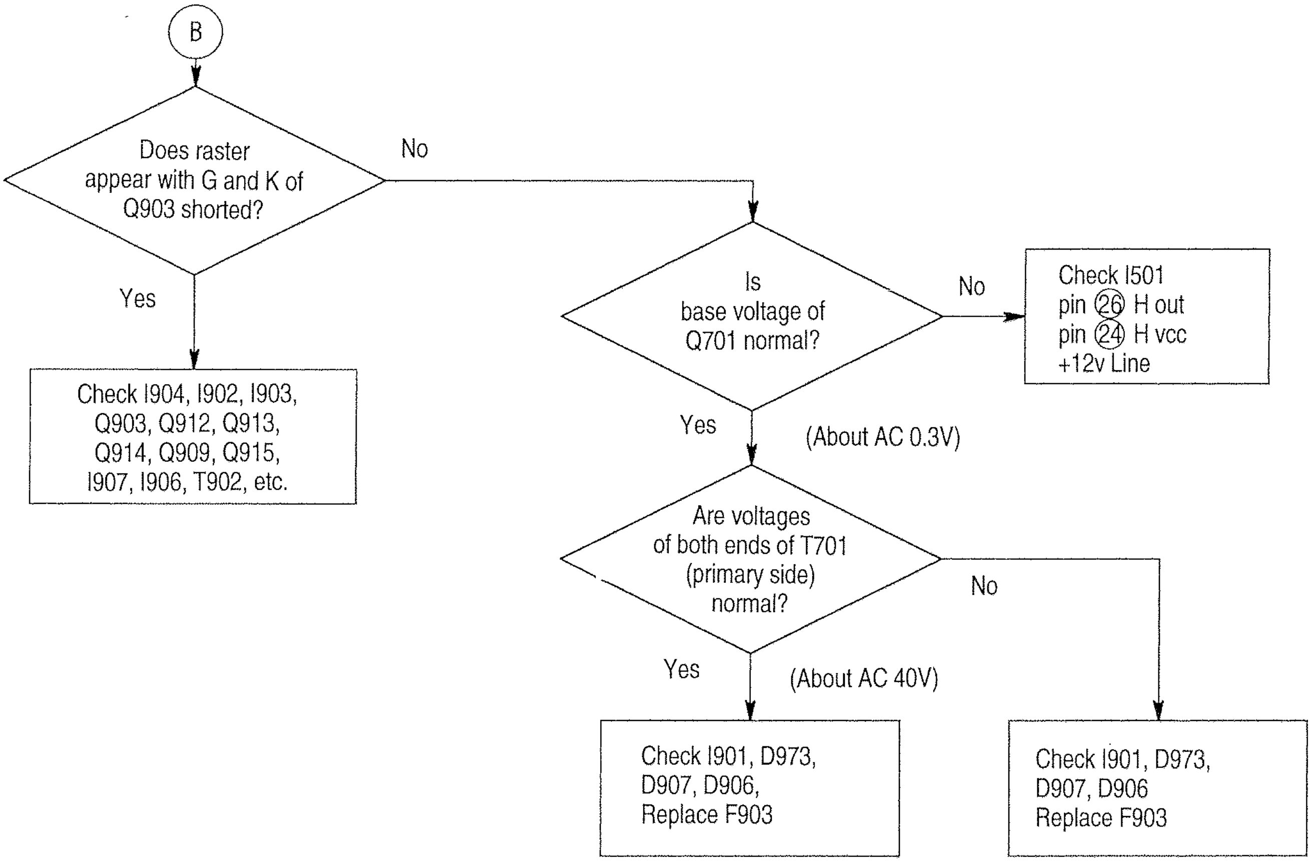
TROUBLESHOOTING

1. No raster


No raster
(Power deflection P.W.B.)
Is click sound of relay heard? S901
NO
YES
Check DIAGNOSIS LED's
Is Red LED "ON"? D975 PROTECTION
NO
A
YES
How to check DIAGNOSIS LED's
1. Turn OFF power SW.
2. Turn ON again after several seconds, and carefully observe 5 green LED's.
Did 5 green LED's turn OFF at the same time?
NO
YES
B
Identify which LED is going dim or off first.
(Other LED's will turn off after trouble circuit.)
D950 +7v
D951 +26v
D952 +11v
D953 -27v
D954 +27v
Check +7v Line I504 (PinP)
Check Audio Line F905 I402 (front out)
Check +11v Line I503 (signal) (+9v Line)
Check -27v Line IK04 IK05 IK06 convergence circuit
Check +27v Line IK04 IK05 IK06 I601 convergence circuit or vert. out
(Signal P.W.B.) with standby mode
Is Voltage at pin (61) of I001 5V?
NO
Check Q902 D912, T901, etc.
YES
Is Voltage at pin (35) of I001 "H"?
NO
Check I001
YES
Check Q004, D909, etc.

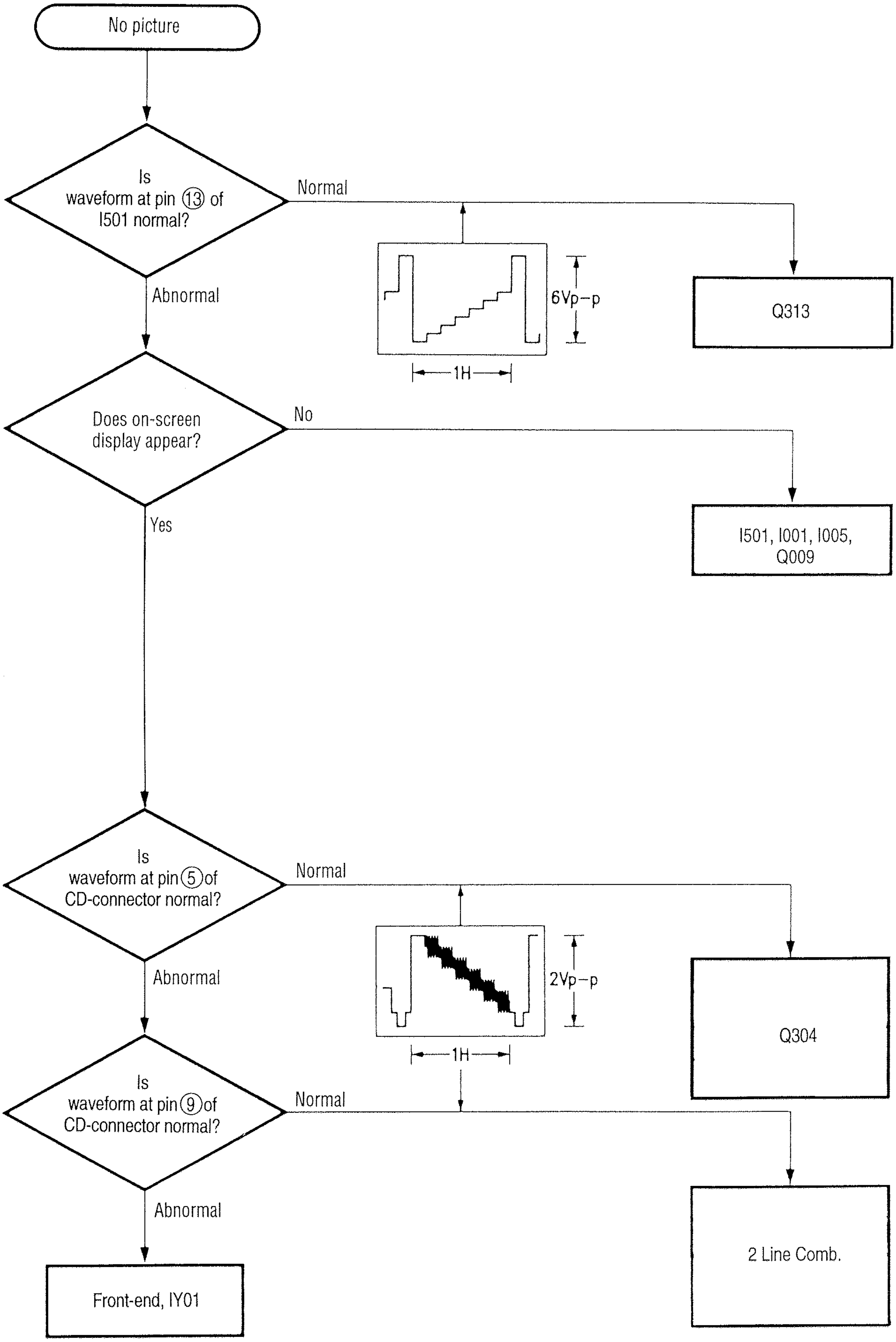
TROUBLESHOOTING


A
Is Voltage at pin ⑤ of I901 10~16v?
No
Check D902, R913, D974, D907, I901
Yes
Has fuse F903 blown?
No
Check I901
Yes
Check I901, D973, D907, D906 Replace F903


B
Does raster appear with G and K of Q903 shorted?
No
Yes
Check I904, I902, I903, Q903, Q912, Q913, Q914, Q909, Q915, I907, I906, T902, etc.
Is base voltage of Q701 normal?
No
Check I501 pin ㉖ H out pin ㉔ H vcc +12v Line
Yes
(About AC 0.3V)
Are voltages of both ends of T701 (primary side) normal?
No
Yes
(About AC 40V)
Check I901, D973, D907, D906, Replace F903
Check I901, D973, D907, D906 Replace F903

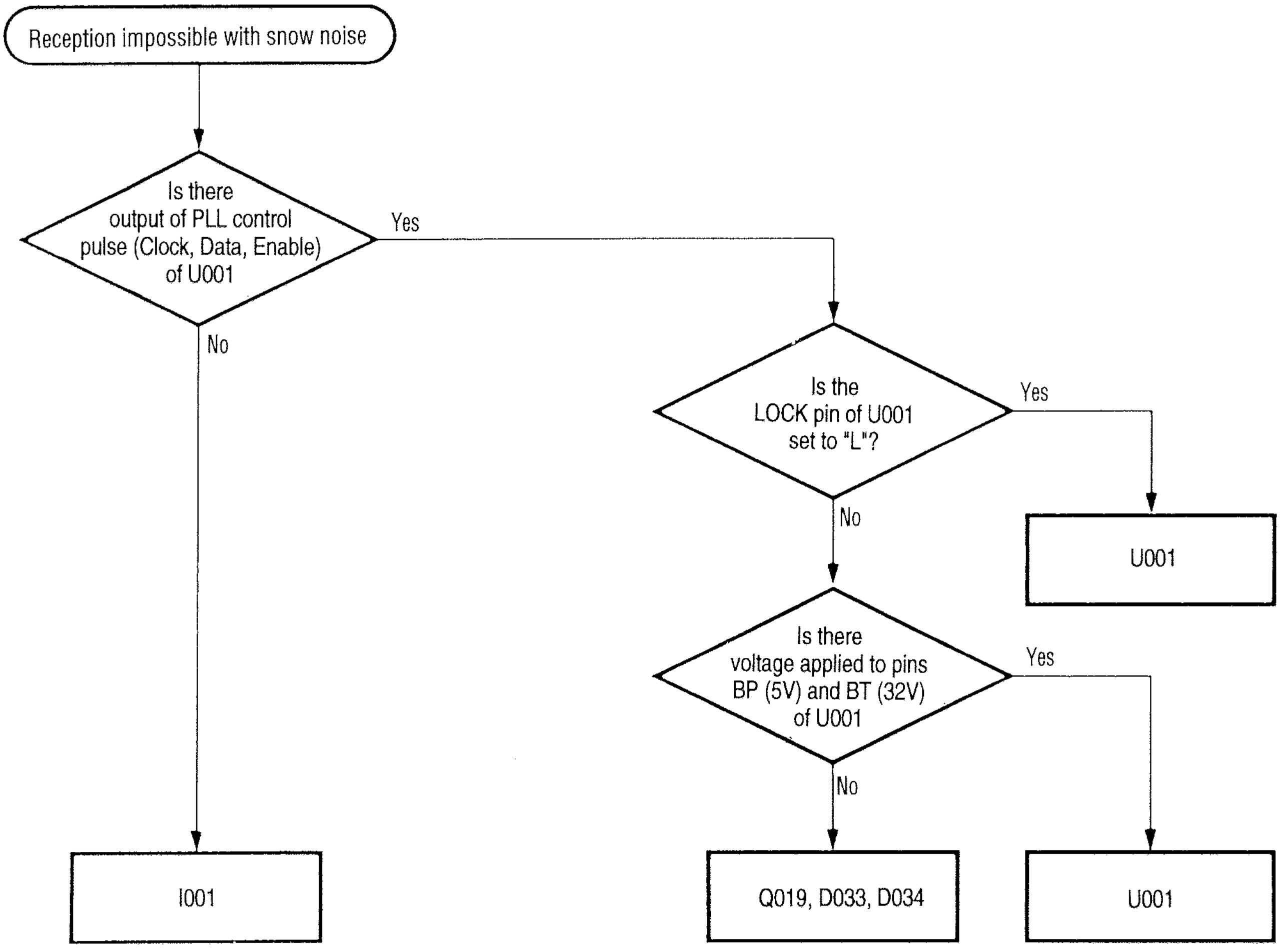
TROUBLESHOOTING

2. No picture

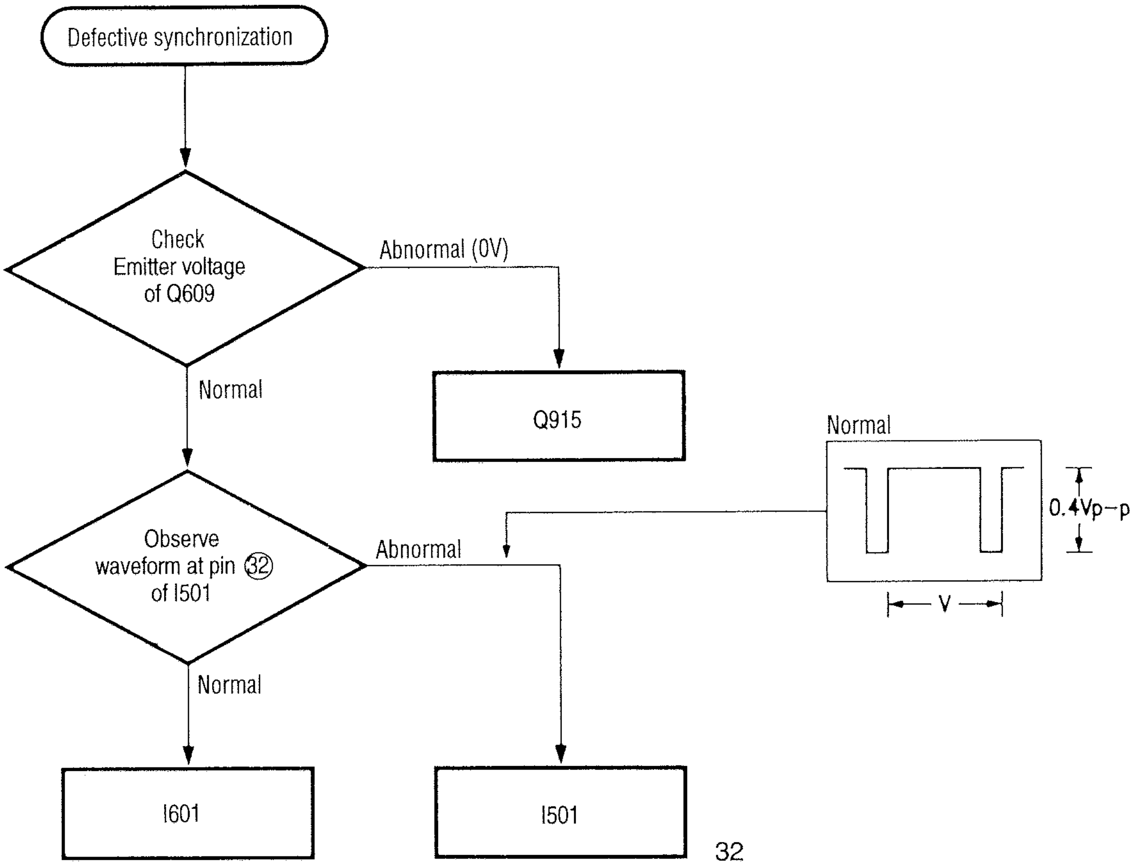

No picture
Is waveform at pin ⑬ of I501 normal?
Normal
Abnormal
6Vp−p
1H
Q313
Does on-screen display appear?
No
Yes
I501, I001, I005, Q009
Is waveform at pin ⑤ of CD-connector normal?
Normal
Abnormal
2Vp−p
1H
Q304
Is waveform at pin ⑨ of CD-connector normal?
Normal
Abnormal
Front-end, IY01
2 Line Comb.

TROUBLESHOOTING

3. Reception impossible with snow noise

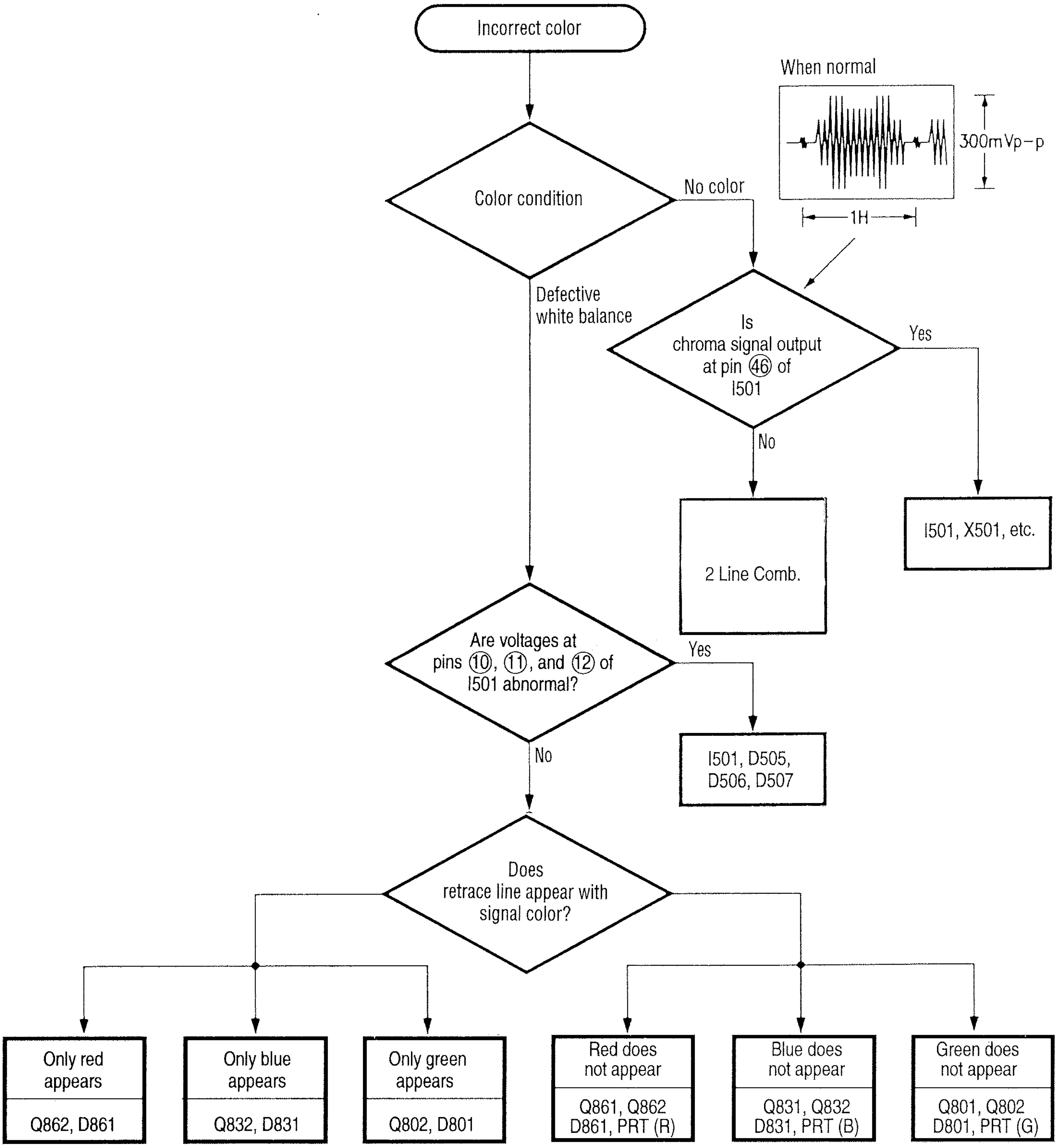

Reception impossible with snow noise
Is there output of PLL control pulse (Clock, Data, Enable) of U001
Yes
No
Is the LOCK pin of U001 set to "L"?
Yes
No
U001
Is there voltage applied to pins BP (5V) and BT (32V) of U001
Yes
No
I001
Q019, D033, D034
U001

4. Defective synchronization


Defective synchronization
Check Emitter voltage of Q609
Abnormal (0V)
Q915
Normal
Normal
0.4Vp-p
V
Observe waveform at pin ㉜ of I501
Abnormal
Normal
I601
I501

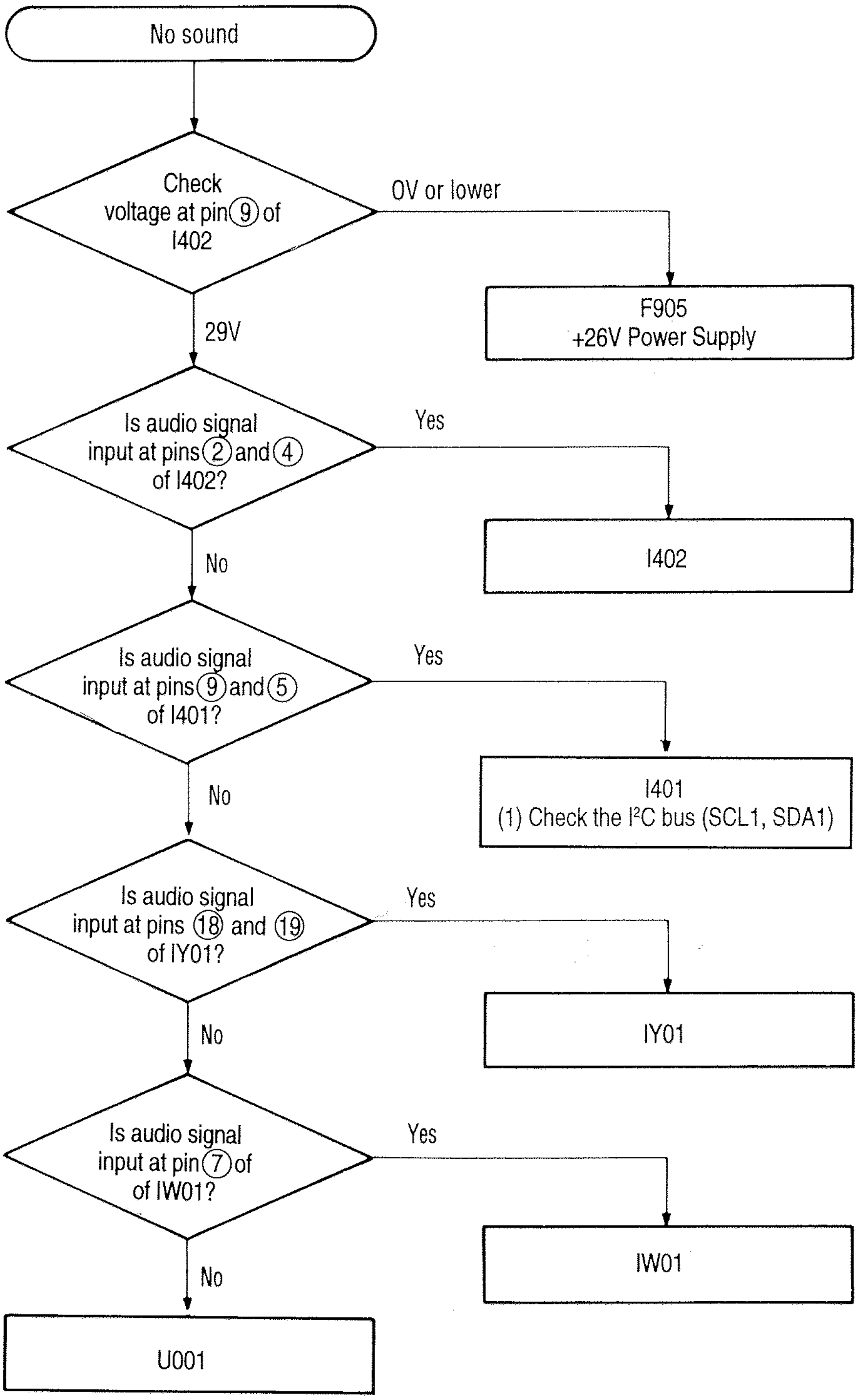
TROUBLESHOOTING

5. Incorrect color


Incorrect color
Color condition
No color
Defective white balance
When normal
300mVp−p
1H
Is chroma signal output at pin ㊻ of I501
Yes
No
2 Line Comb.
I501, X501, etc.
Are voltages at pins ⑩, ⑪, and ⑫ of I501 abnormal?
Yes
No
I501, D505, D506, D507
Does retrace line appear with signal color?
Only red appears
Q862, D861
Only blue appears
Q832, D831
Only green appears
Q802, D801
Red does not appear
Q861, Q862 D861, PRT (R)
Blue does not appear
Q831, Q832 D831, PRT (B)
Green does not appear
Q801, Q802 D801, PRT (G)

TROUBLESHOOTING

6. No sound

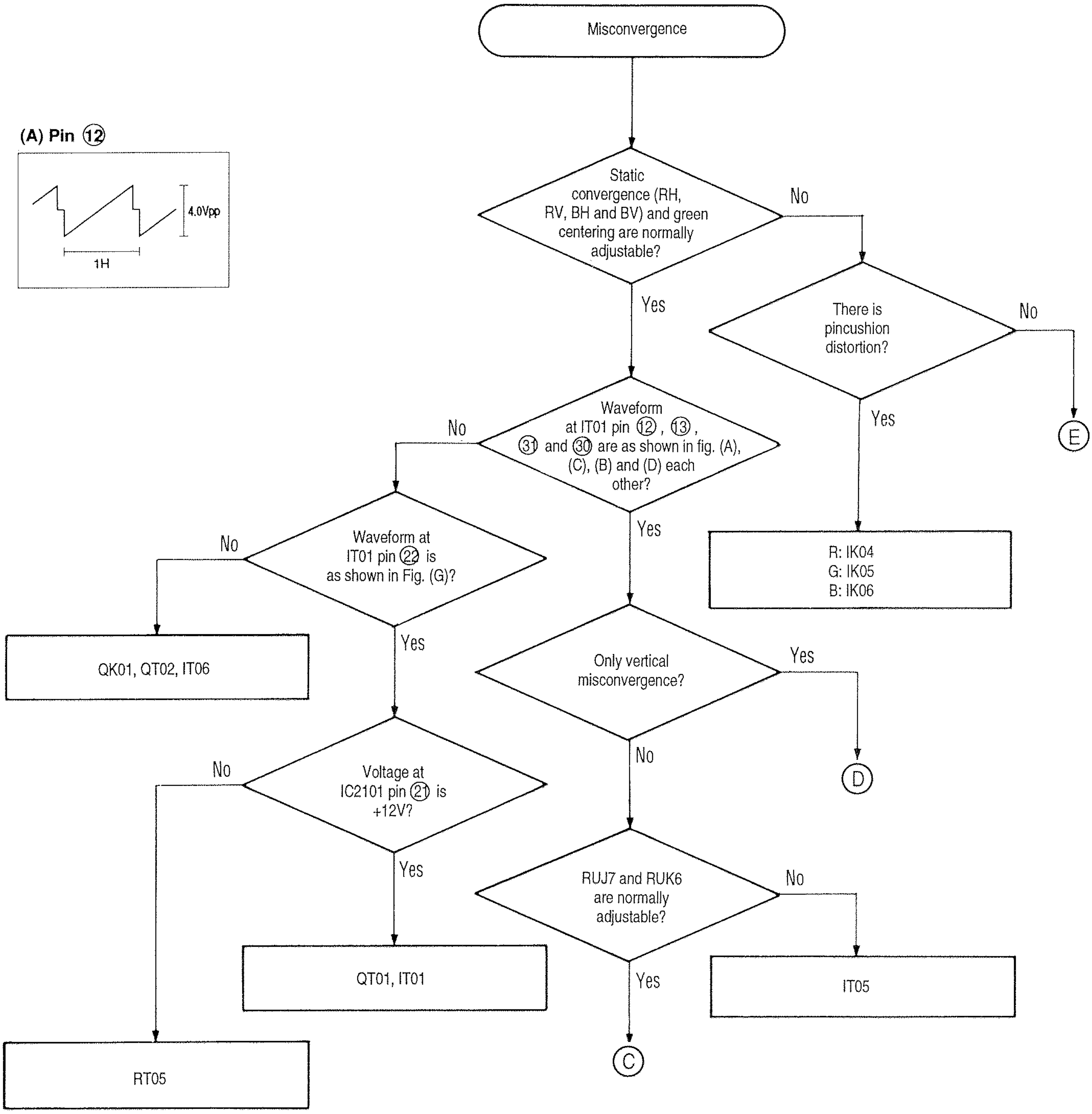

No sound
Check voltage at pin ⑨ of I402
0V or lower
F905 +26V Power Supply
29V
Is audio signal input at pins ② and ④ of I402?
Yes
I402
No
Is audio signal input at pins ⑨ and ⑤ of I401?
Yes
I401 (1) Check the I²C bus (SCL1, SDA1)
No
Is audio signal input at pins ⑱ and ⑲ of IY01?
Yes
IY01
No
Is audio signal input at pin ⑦ of of IW01?
Yes
IW01
No
U001

TROUBLESHOOTING

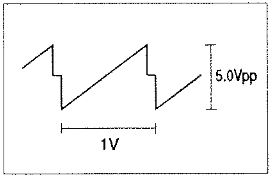
7. Misconvergence

(A) Pin ⑫

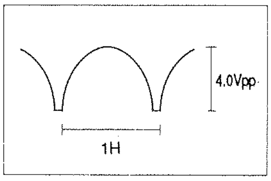
4.0Vpp
1H


Misconvergence
Static convergence (RH, RV, BH and BV) and green centering are normally adjustable?
No
There is pincushion distortion?
No
E
Yes
R: IK04
G: IK05
B: IK06
Yes
Waveform at IT01 pin ⑫, ⑬, ㉛ and ㉚ are as shown in fig. (A), (C), (B) and (D) each other?
No
Waveform at IT01 pin ㉒ is as shown in Fig. (G)?
No
QK01, QT02, IT06
Yes
Voltage at IC2101 pin ㉑ is +12V?
No
RT05
Yes
QT01, IT01
Yes
Only vertical misconvergence?
Yes
D
No
RUJ7 and RUK6 are normally adjustable?
No
IT05
Yes
C

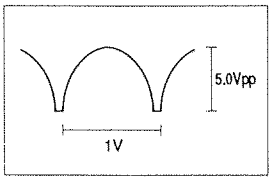
(B) Pin ㉛



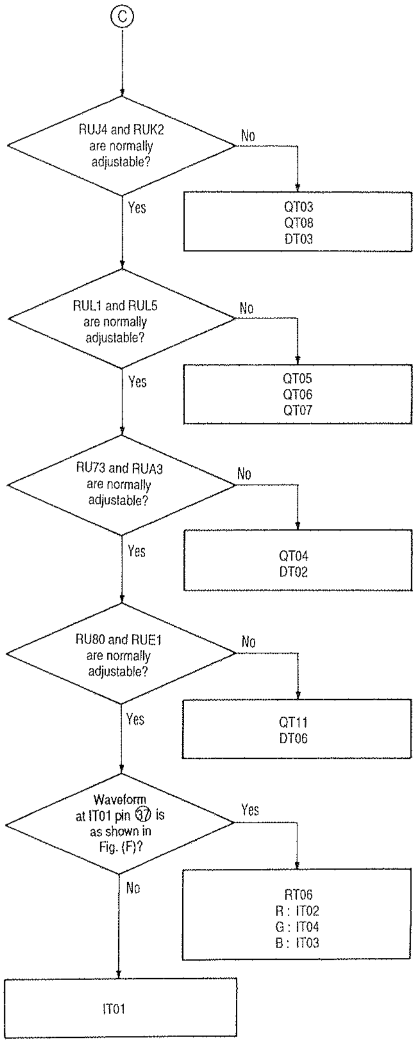
(C) Pin ⑬

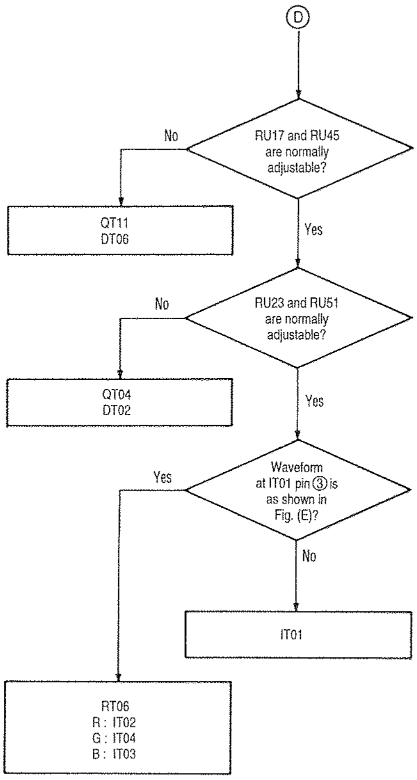


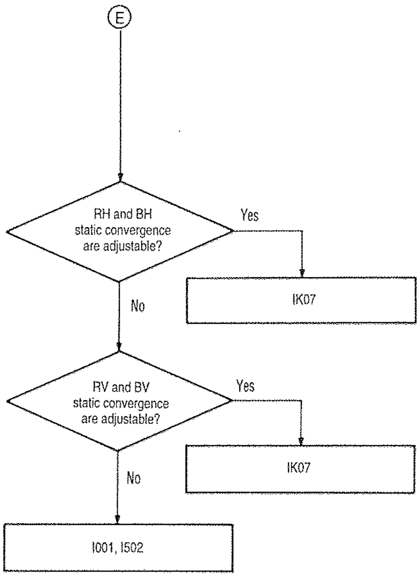
(D) Pin ㉚



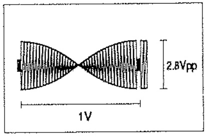
TROUBLESHOOTING


C
RUJ4 and RUK2 are normally adjustable?
No
QT03
QT08
DT03
Yes
RUL1 and RUL5 are normally adjustable?
No
QT05
QT06
QT07
Yes
RU73 and RUA3 are normally adjustable?
No
QT04
DT02
Yes
RU80 and RUE1 are normally adjustable?
No
QT11
DT06
Yes
Waveform at IT01 pin ㊲ is as shown in Fig. (F)?
Yes
RT06
R : IT02
G : IT04
B : IT03
No
IT01

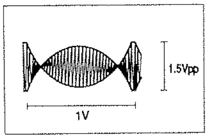

D
RU17 and RU45 are normally adjustable?
No
QT11
DT06
Yes
RU23 and RU51 are normally adjustable?
No
QT04
DT02
Yes
Waveform at IT01 pin ③ is as shown in Fig. (E)?
Yes
RT06
R : IT02
G : IT04
B : IT03
No
IT01


E
RH and BH static convergence are adjustable?
Yes
IK07
No
RV and BV static convergence are adjustable?
Yes
IK07
No
I001, I502

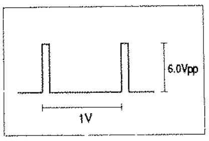
(E) Pin ③



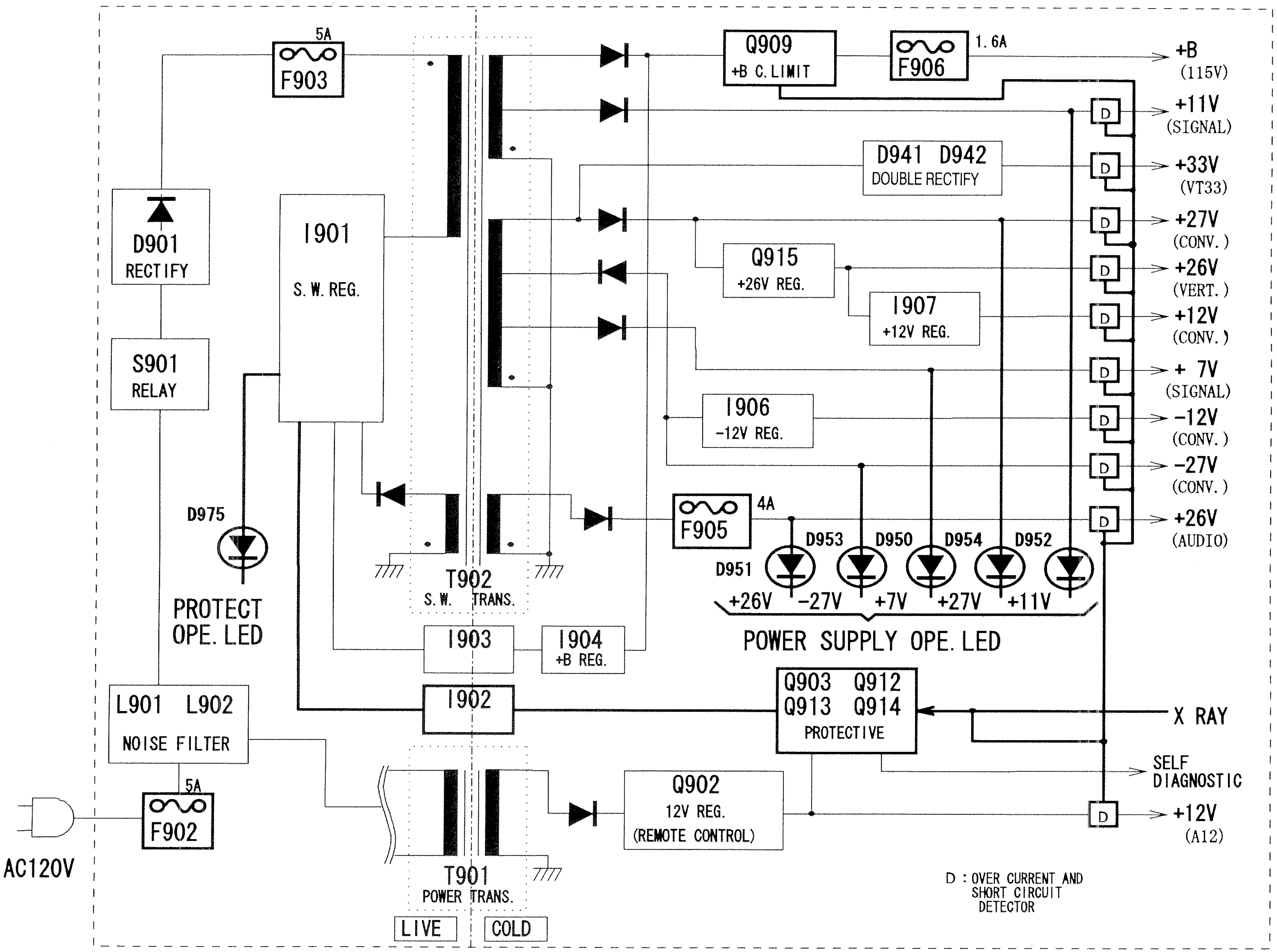
(F) Pin ㊲



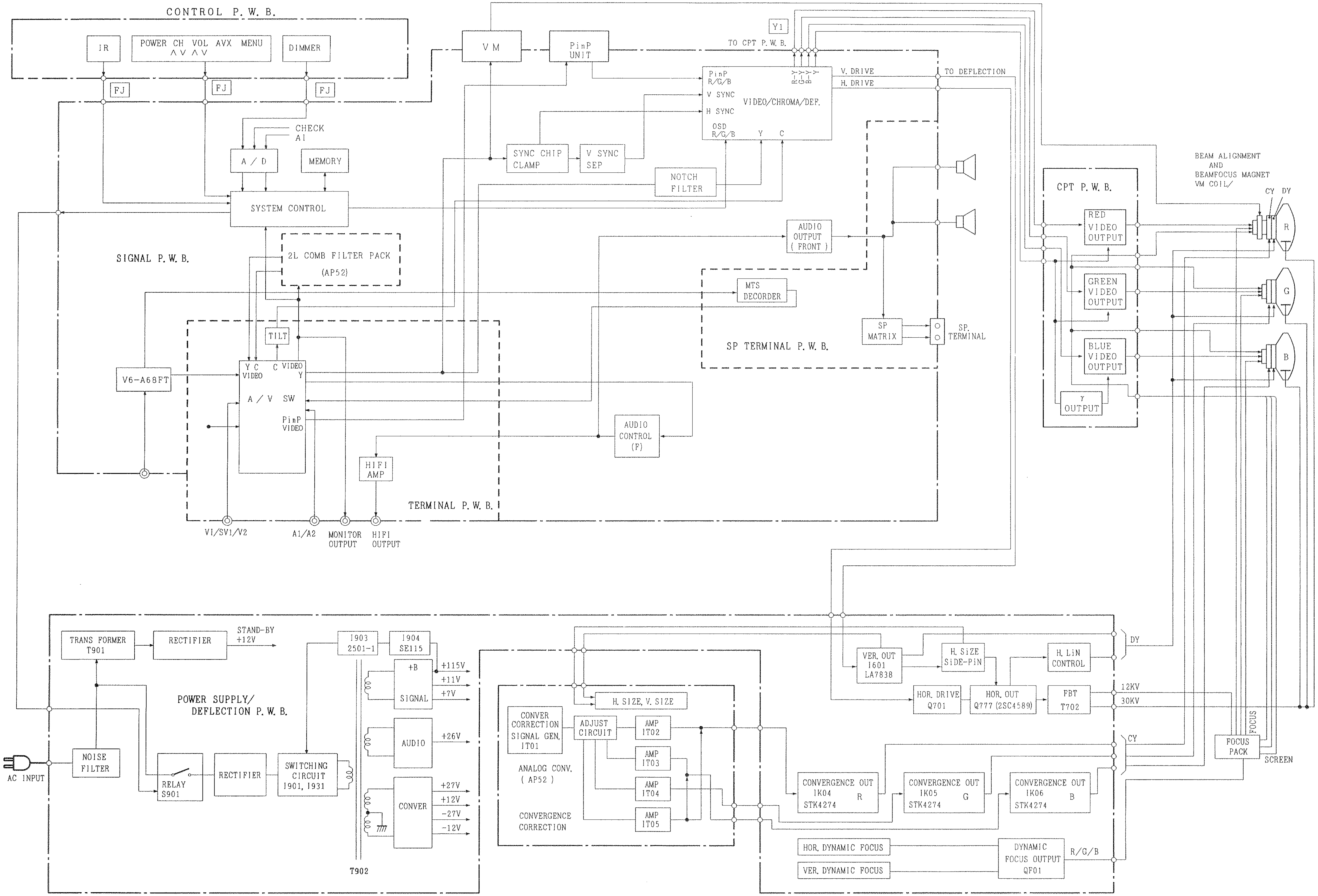
(G) Pin ㉒



PROTECTION CIRCUIT BLOCK DIAGRAM

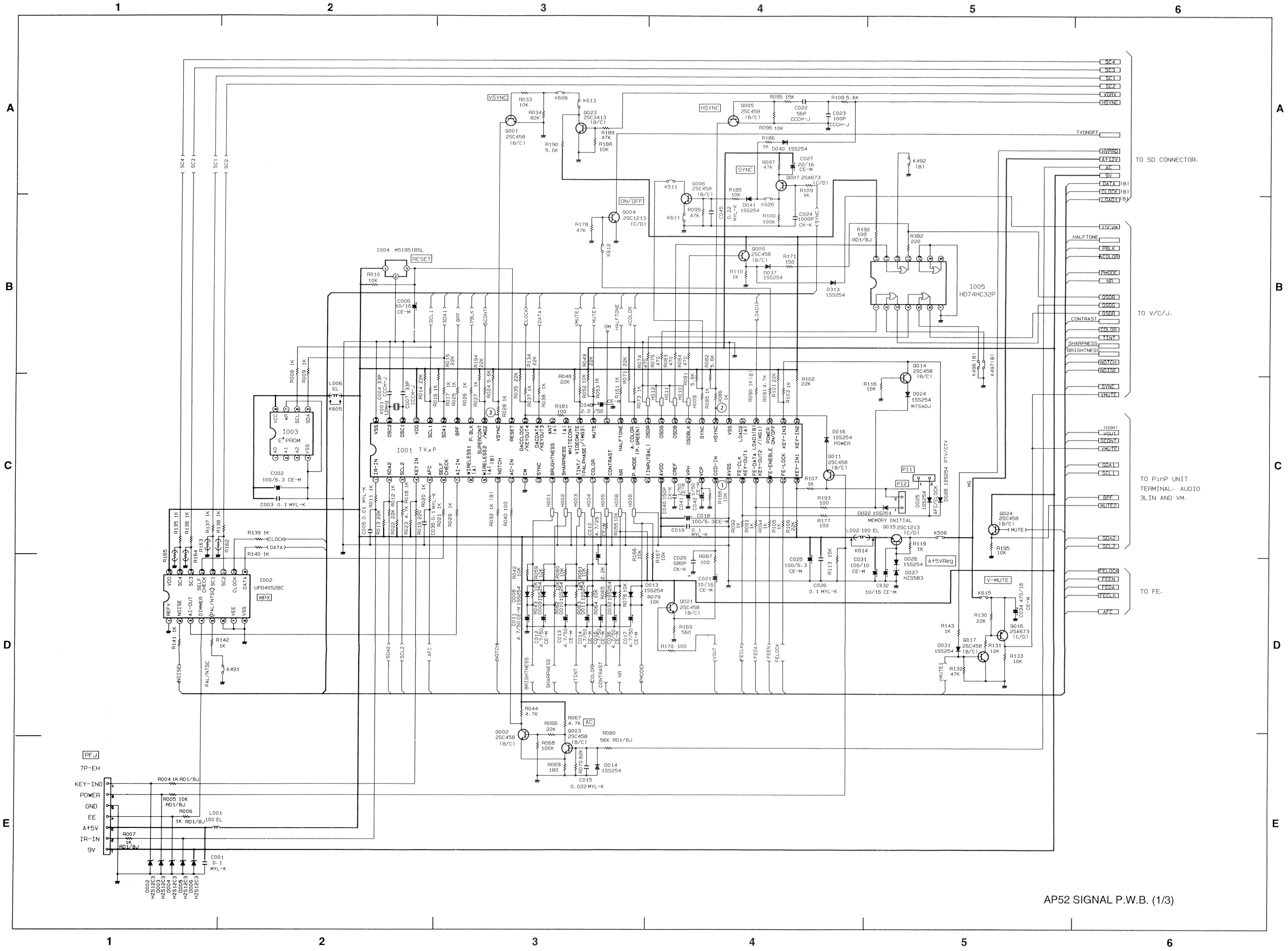

5A
F903
D901
RECTIFY
S901
RELAY
I901
S.W. REG.
D975
PROTECT
OPE. LED
L901 L902
NOISE FILTER
5A
F902
AC120V
T902
S.W. TRANS.
I903
I904
+B REG.
I902
T901
POWER TRANS.
LIVE
COLD
Q909
+B C.LIMIT
F906
1.6A
+B
(115V)
+11V
(SIGNAL)
D941 D942
DOUBLE RECTIFY
+33V
(VT33)
+27V
(CONV.)
Q915
+26V REG.
+26V
(VERT.)
I907
+12V REG.
+12V
(CONV.)
+ 7V
(SIGNAL)
I906
-12V REG.
-12V
(CONV.)
-27V
(CONV.)
F905
4A
+26V
(AUDIO)
D953
D950
D954
D952
D951
+26V
-27V
+7V
+27V
+11V
POWER SUPPLY OPE. LED
Q903 Q912
Q913 Q914
PROTECTIVE
X RAY
SELF
DIAGNOSTIC
Q902
12V REG.
(REMOTE CONTROL)
+12V
(A12)
D
D : OVER CURRENT AND
SHORT CIRCUIT
DETECTOR

AP52 BLOCK DIAGRAM


CONTROL P. W. B.
IR
POWER CH VOL AVX MENU
∧ ∨ ∧ ∨
DIMMER
FJ
FJ
FJ
CHECK
AI
A / D
MEMORY
SYSTEM CONTROL
SIGNAL P. W. B.
2L COMB FILTER PACK
(AP52)
V M
PinP UNIT
Y1
TO CPT P. W. B.
PinP R/G/B
V SYNC
H SYNC
OSD R/G/B
Y
C
VIDEO/CHROMA/DEF.
R G B B
V. DRIVE
H. DRIVE
TO DEFLECTION
SYNC CHIP CLAMP
V SYNC SEP
NOTCH FILTER
AUDIO OUTPUT (FRONT)
MTS DECORDER
SP MATRIX
SP. TERMINAL
SP TERMINAL P. W. B.
TILT
V6-A68FT
Y C VIDEO
C VIDEO Y
A / V SW
PinP VIDEO
AUDIO CONTROL (F)
HIFI AMP
TERMINAL P. W. B.
VI/SV1/V2
A1/A2
MONITOR OUTPUT
HIFI OUTPUT
BEAM ALIGNMENT AND BEAMFOCUS MAGNET VM COIL/
CY DY
CPT P. W. B.
RED VIDEO OUTPUT
GREEN VIDEO OUTPUT
BLUE VIDEO OUTPUT
Y OUTPUT
R
G
B
TRANS FORMER T901
RECTIFIER
STAND-BY +12V
I903 2501-1
I904 SE115
+B
SIGNAL
+115V
+11V
+7V
AUDIO
+26V
CONVER
+27V
+12V
-27V
-12V
T902
POWER SUPPLY/ DEFLECTION P. W. B.
AC INPUT
NOISE FILTER
RELAY S901
RECTIFIER
SWITCHING CIRCUIT I901, I931
CONVER CORRECTION SIGNAL GEN. IT01
ADJUST CIRCUIT
H. SIZE, V. SIZE
AMP IT02
AMP IT03
AMP IT04
AMP IT05
ANALOG CONV. (AP52)
CONVERGENCE CORRECTION
VER. OUT I601 LA7838
H. SiZE SiDE-PiN
H. LiN CONTROL
DY
HOR. DRIVE Q701
HOR. OUT Q777 (2SC4589)
FBT T702
12KV
30KV
FOCUS
FOCUS PACK
SCREEN
CY
CONVERGENCE OUT IK04 STK4274 R
CONVERGENCE OUT IK05 STK4274 G
CONVERGENCE OUT IK06 STK4274 B
HOR. DYNAMIC FOCUS
VER. DYNAMIC FOCUS
DYNAMIC FOCUS OUTPUT QF01
R/G/B

BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
I001 TVμP
I002 UPD4052BC
MPX
I003 E²PROM
I004 M51951BSL
RESET
I005 HD74HC32P
VSYNC
HSYNC
SYNC
ON/OFF
TO SD CONNECTOR.
TO V/C/J.
TO PinP UNIT TERMINAL, AUDIO 3LIN AND VM.
TO FE.
MEMORY INITIAL
+5VReg
V-MUTE
AC
PFJ
7P-EH
KEY-IN0
POWER
GND
EE
A+5V
IR-IN
9V
SC4
SC3
SC1
SC2
VDRV
TVONOFF
HVPRO
A+12V
DATA
CLOCK
LOAD1
HALFTONE
CONTRAST
SHARPNESS
BRIGHTNESS
NOTCH
NOISE
VMUTE
SDA1
SCL1
BPF
MUTER
SDA2
SCL2
FELOCK
FEEN
FEDA
FECLK
AFC

AP52 SIGNAL P.W.B. (1/3)

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
I001	1	0.1
	2	5.1
	3	5.1
	4	5.2
	5	3.2
	6	0.5
	7	3.3
	8	0
	9	0
	10	0
	11	2.5
	12	0
	13	2.6
	14	2.4
	15	2.4
	16	2.6
	17	2.5
	18	7.3
	19	8.9
	20	8.8
	21	0
	22	5.2
	23	0
	24	1.3
	25	1.1
	26	2.0
	27	0
	28	5.0
	29	5.0
	30	0.2
	31	0.1
	32	5.2

Circuit No.	Pin No.	Voltage VDC
I001	33	5.0
	34	5.0
	35	5.1
	36	0
	37	5.2
	38	0
	39	4.8
	40	0.1
	41	0
	42	0
	43	0
	44	0
	45	8.1
	46	0
	47	0
	48	0
	49	0
	50	0
	51	0
	52	5.2
	53	5.2
	54	5.2
	55	5.0
	56	0
	57	0
	58	5.2
	59	5.1
	60	5.1
	61	5.2
	62	2.4
	63	2.2
	64	0

Circuit No.	Pin No.	Voltage VDC
I002	1	0
	2	3.8
	3	2.4
	4	2.4
	5	0
	6	0
	7	0
	8	0
	9	5.2
	10	5.2
	11	0.5
	12	0.3
	13	0.5
	14	0.1
	15	0.1
	16	5.2

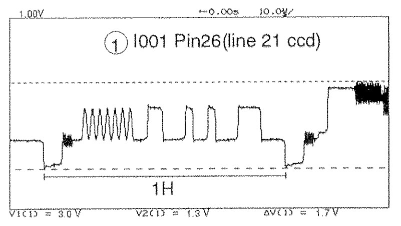
Circuit No.	Pin No.	Voltage VDC
I003	1	0
	2	0
	3	0
	4	0
	5	5.1
	6	5.1
	7	0
	8	5.2

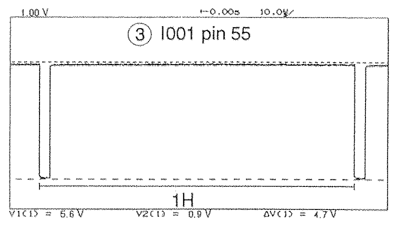
Circuit No.	Pin No.	Voltage VDC
I004	1	5.2
	2	0
	3	5.2

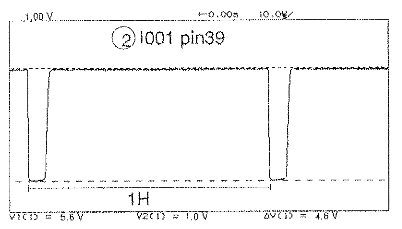
Circuit No.	Pin No.	Voltage VDC
I005	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
	8	0
	9	0
	10	0
	11	0
	12	0
	13	0
	14	5.2

Circuit No.	Pin No.	Voltage VDC
Q001	B	0.1
	C	5.0
	E	0
Q002	B	0.6
	C	2.5
	E	0.2
Q003	B	0.4
	C	2.5
	E	0.2
Q004	B	0.7
	C	0.1
	E	0
Q005	B	0
	C	4.8
	E	0
Q006	B	0.7
	C	0.1
	E	0
Q007	B	5.3
	C	0.8
	E	5.2
Q009	B	0
	C	5.2
	E	0

Circuit No.	Pin No.	Voltage VDC
Q011	B	0
	C	5.2
	E	0
Q014	B	0
	C	5.0
	E	0
Q015	B	5.9
	C	12.4
	E	5.2
Q016	B	12.4
	C	0
	E	12.4
Q017	B	0
	C	12.3
	E	0
Q021	B	3.9
	C	9.1
	E	3.2
Q023	B	0.6
	C	0.2
	E	0
Q024	B	0
	C	9.1
	E	0

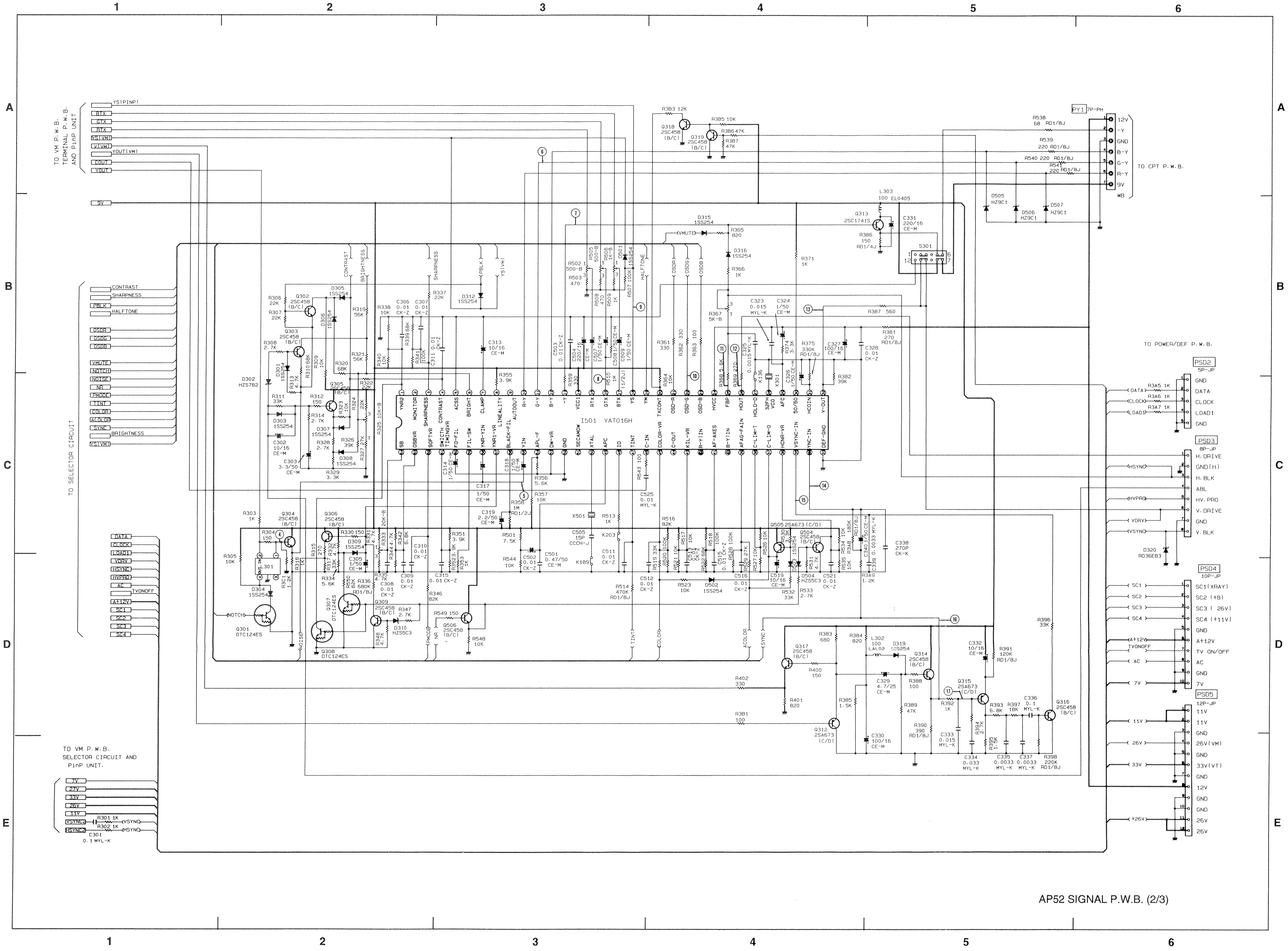






BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
TO VM P.W.B. TERMINAL P.W.B. AND PinP UNIT
TO SELECTOR CIRCUIT
TO VM P.W.B. SELECTOR CIRCUIT AND PinP UNIT.
I501 YAT016H
TO CPT P.W.B.
TO POWER/DEF P.W.B.
PY1 7P-PH
PSD2 5P-JP
PSD3 8P-JP
PSD4 10P-JP
PSD5 12P-JP
S301

AP52 SIGNAL P.W.B. (2/3)

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

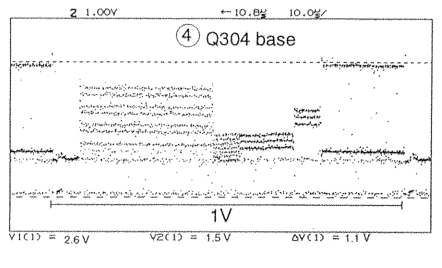
Circuit No.	Pin No.	Voltage VDC
I501	1	0
	2	0
	3	4.2
	4	7.1
	5	0
	6	4.6
	7	6.9
	8	8.9
	9	0.1
	10	5.1
	11	5.2
	12	5.3
	13	4.6
	14	9.1
	15	3.1
	16	3.1
	17	3.1
	18	0
	19	0
	20	4.9
	21	0
	22	0
	23	0
	24	7.8
	25	1.3
	26	0.8
	27	0
	28	5.0
	29	5.5
	30	8.8
	31	7.6
	32	4.5

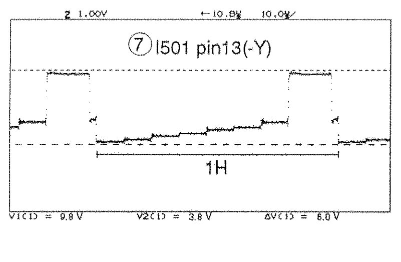
Circuit No.	Pin No.	Voltage VDC
I501	33	0
	34	7.0
	35	6.5
	36	0
	37	4.2
	38	4.0
	39	6.5
	40	1.3
	41	3.6
	42	1.3
	43	4.2
	44	6.5
	45	4.6
	46	3.2
	47	4.5
	48	0.7
	49	5.9
	50	5.5
	51	1.4
	52	0
	53	0
	54	3.3
	55	3.8
	56	6.1
	57	4.4
	58	3.8
	59	0
	60	4.3
	61	4.1
	62	6.0
	63	3.7
	64	5.5

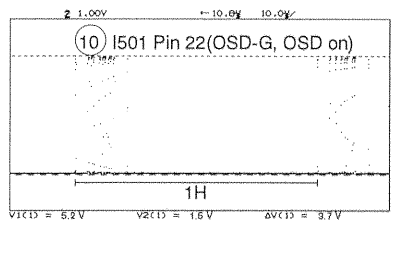
Circuit No.	Pin No.	Voltage VDC
Q301	B	0
	C	8.5
	E	0
Q302	B	0
	C	9.1
	E	0
Q303	B	1.0
	C	4.2
	E	0.5
Q304	B	2.0
	C	9.0
	E	1.3
Q305	B	8.1
	C	9.1
	E	7.4
Q306	B	4.4
	C	9.1
	E	3.8
Q307	B	8.1
	C	4.8
	E	0
Q308	B	8.1
	C	0
	E	0

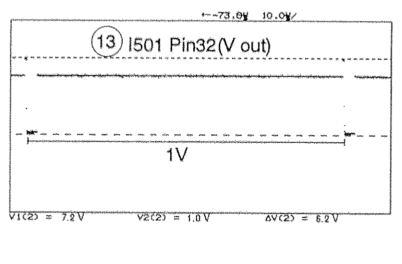
Circuit No.	Pin No.	Voltage VDC
Q309	B	0.7
	C	0
	E	0
Q312	B	4.6
	C	0
	E	5.2
Q313	B	4.7
	C	9.0
	E	4.0
Q314	B	6.0
	C	9.1
	E	5.3
Q315	B	5.3
	C	0
	E	5.2
Q316	B	-0.2
	C	6.4
	E	0
Q318	B	0.7
	C	0
	E	0
Q319	B	0
	C	0.7
	E	0

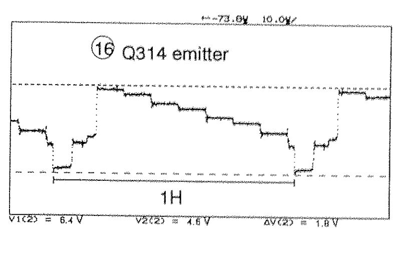
Circuit No.	Pin No.	Voltage VDC
Q504	B	0.7
	C	0
	E	0
Q505	B	9.0
	C	4.2
	E	9.1
Q506	B	8.8
	C	9.1
	E	8.1

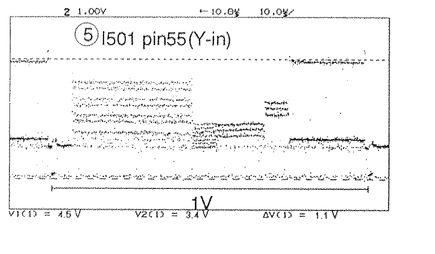

④ Q304 base

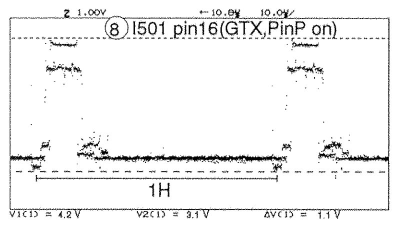

⑦ I501 pin13(-Y)

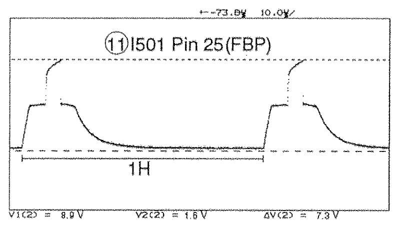

⑩ I501 Pin 22(OSD-G, OSD on)

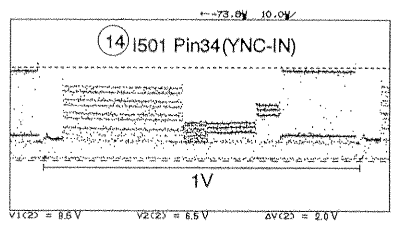

⑬ I501 Pin32(V out)

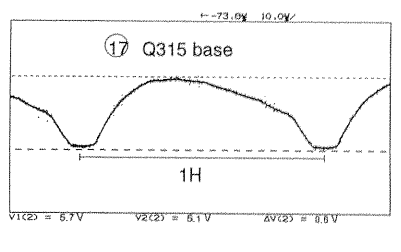

⑯ Q314 emitter

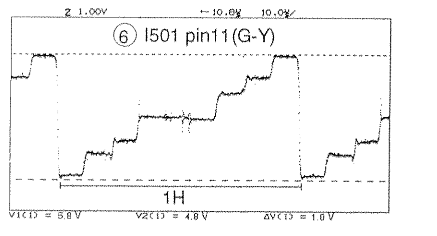

⑤ I501 pin55(Y-in)

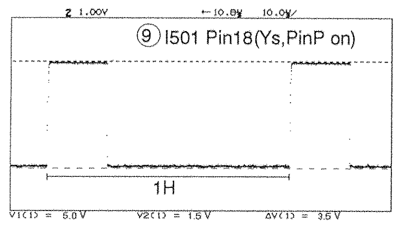

⑧ I501 pin16(GTX,PinP on)

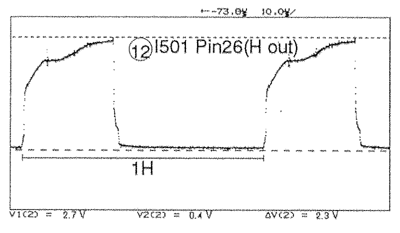

⑪ I501 Pin 25(FBP)

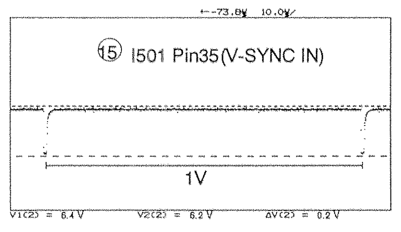

⑭ I501 Pin34(YNC-IN)


⑰ Q315 base


⑥ I501 pin11(G-Y)


⑨ I501 Pin18(Ys,PinP on)


⑫ I501 Pin26(H out)


⑮ I501 Pin35(V-SYNC IN)

BASIC CIRCUIT DIAGRAM

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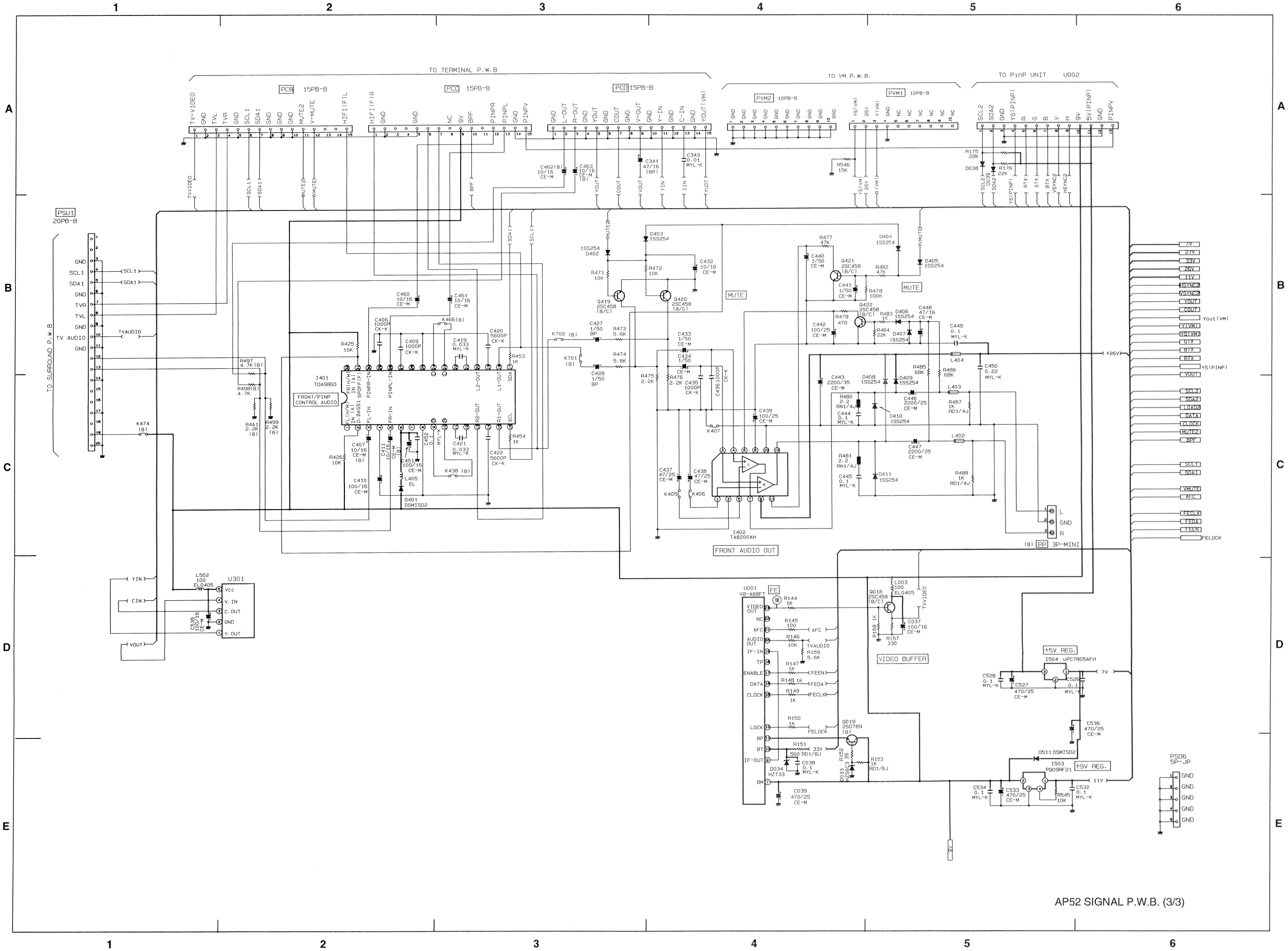
1
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3
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6
A
B
C
D
E
TO TERMINAL P.W.B
PCB 15PB-B
PCC 15PB-B
PCD 15PB-B
TO VM P.W.B.
PVM2 10PB-B
PVM1 10PB-B
TO PinP UNIT U002
PSU1 20PB-B
TO SURROUND P.W.B
GND
SCL1
SDA1
TVR
TVL
TV AUDIO
I401 TDA9860
FRONT/PINP CONTROL AUDIO
MUTE
I402 TA8200AH
FRONT AUDIO OUT
PP 3P-MINI
L
GND
R
U301
VCC
V.IN
C.OUT
GND
Y.OUT
U001 VB-A68F
FE
VIDEO OUT
NC
AFC
AUDIO OUT
IF-IN
TP
ENABLE
DATA
CLOCK
LOCK
BP
BT
IF-OUT
BM
Q018 2SC458
Q019 2SD789
VIDEO BUFFER
+5V REG.
I504 uPC7805AFH
+9V REG.
I503 PQ09RF21
PSD6 5P-JP
7V
27V
33V
26V
11V
HSYNC2
VSYNC2
YOUT
COUT
Yout(VM)
Y(VM)
YS(VM)
GTX
BTX
RTX
YS(PINP)
VOUT
SCL2
SDA2
LOAD2
DATA
CLOCK
MUTE2
BPF
SCL1
SDA1
VMUTE
AFC
FECLK
FEDA
FEEN
FELOCK

AP52 SIGNAL P.W.B. (3/3)

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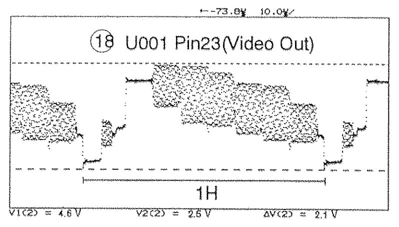
Circuit No.	Pin No.	Voltage VDC
I401	1	4.1
	2	0.2
	3	4.1
	4	8.2
	5	4.1
	6	8.3
	7	4.2
	8	0
	9	4.2
	10	4.2
	11	4.2
	12	4.2
	13	4.2
	14	4.2
	15	4.2
	16	5.1
	17	5.1
	18	4.2
	19	4.2
	20	4.2
	21	4.2
	22	4.2
	23	4.2
	24	4.2
	25	0
	26	4.2
	27	4.2
	28	4.2
	29	4.2
	30	4.2
	31	0.2
	32	4.2

Circuit No.	Pin No.	Voltage VDC
I402	1	1.6
	2	0
	3	0
	4	0
	5	1.6
	6	9.1
	7	12.5
	8	5.0
	9	27.1
	10	0
	11	4.1
	12	12.3

Circuit No.	Pin No.	Voltage VDC
I503	1	12.7
	2	9.1
	3	0
	4	12.7

Circuit No.	Pin No.	Voltage VDC
I504	1	8.3
	2	0
	3	4.9

Circuit No.	Pin No.	Voltage VDC
Q419	B	0.2
	C	0
	E	0
Q420	B	0.2
	C	0
	E	0
Q421	B	0
	C	4.1
	E	0
Q422	B	0
	C	9.1
	E	0
Q018	B	1.7
	C	9.0
	E	1.0
Q019	B	6.2
	C	9.0
	E	5.6



BASIC CIRCUIT DIAGRAM

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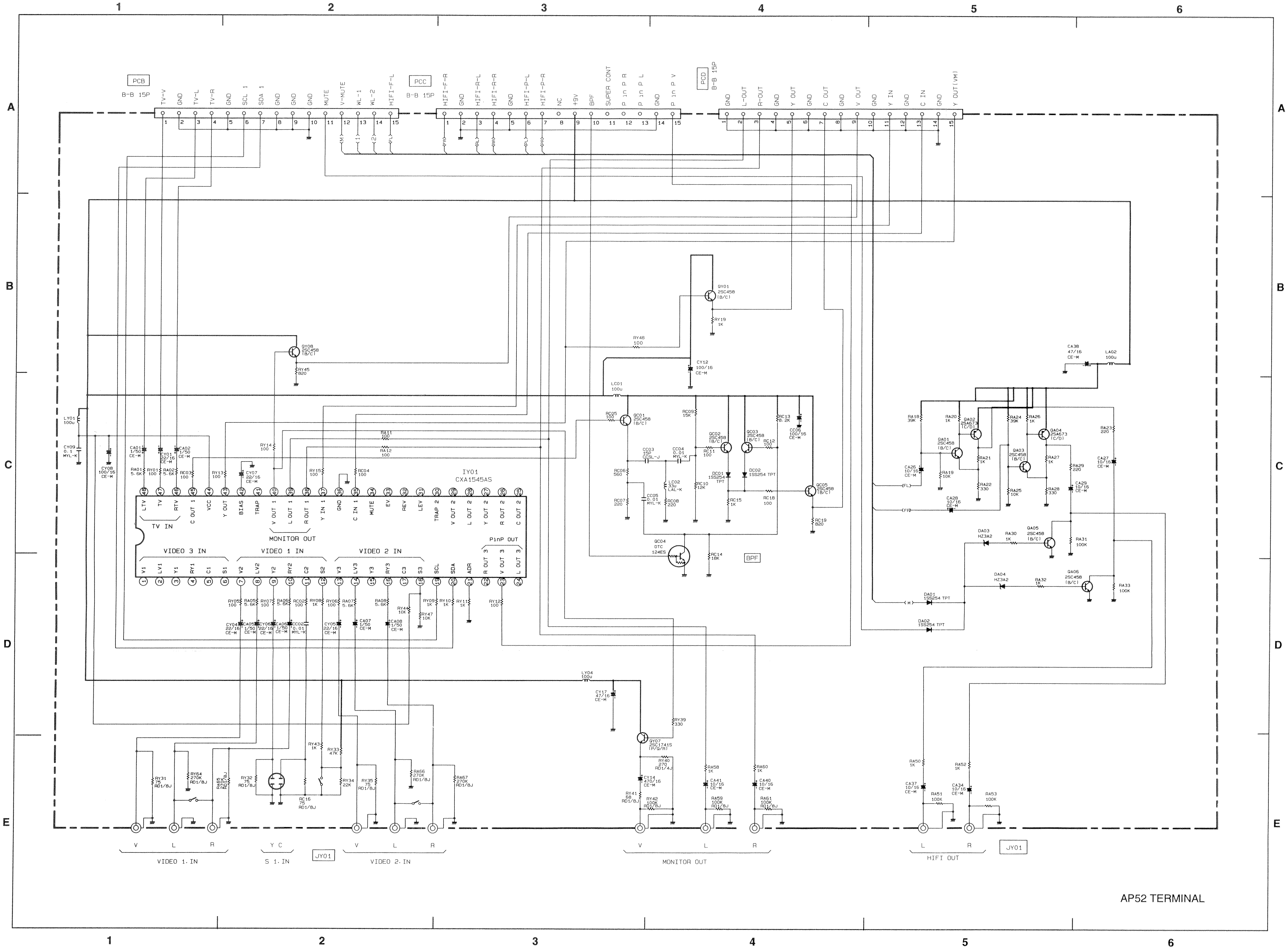
1
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5
6
A
B
C
D
E
PCB
B-B 15P
TV-V
GND
TV-L
TV-R
GND
SCL 1
SDA 1
GND
GND
GND
MUTE
V-MUTE
WL-1
WL-2
HIFI-F-L
PCC
B-B 15P
HIFI-F-R
GND
HIFI-R-L
HIFI-R-R
GND
HIFI-P-L
HIFI-P-R
NC
+9V
BPF
SUPER CONT
P in P R
P in P L
GND
P in P V
PCD
B-B 15P
GND
L-OUT
R-OUT
GND
Y OUT
GND
C OUT
GND
V OUT
GND
Y IN
GND
C IN
GND
Y OUT(VM)
IY01
CXA1545AS
TV IN
MONITOR OUT
VIDEO 3 IN
VIDEO 1 IN
VIDEO 2 IN
PinP OUT
QY01
2SC458
(B/C)
QY08
2SC458
(B/C)
QY07
2SC1741S
(R/Q/R)
QC01
2SC458
(B/C)
QC02
2SC458
(B/C)
QC03
2SC458
(B/C)
QC04
DTC
124ES
QC05
2SC458
(B/C)
QA01
2SC458
(B/C)
QA02
2SA673
(C/D)
QA03
2SC458
(B/C)
QA04
2SA673
(C/D)
QA05
2SC458
(B/C)
QA06
2SC458
(B/C)
BPF
V
L
R
VIDEO 1. IN
Y C
S 1. IN
JY01
V
L
R
VIDEO 2. IN
V
L
R
MONITOR OUT
L
R
HIFI OUT
JY01
AP52 TERMINAL
1
2
3
4
5
6

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
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Circuit No.	Pin No.	Voltage VDC
IY01	1	4.7
	2	4.7
	3	4.7
	4	4.7
	5	4.7
	6	2.5
	7	4.7
	8	4.7
	9	4.7
	10	4.7
	11	4.7
	12	2.5
	13	4.7
	14	4.7
	15	4.7
	16	4.7
	17	4.7
	18	4.3
	19	5.1
	20	5.1
	21	0
	22	4.8
	23	4.6
	24	4.8

Circuit No.	Pin No.	Voltage VDC
IY01	25	4.7
	26	4.8
	27	4.7
	28	4.8
	29	4.7
	30	4.7
	31	4.7
	32	4.7
	33	4.7
	34	0
	35	4.7
	36	0
	37	4.7
	38	4.8
	39	4.8
	40	4.6
	41	4.7
	42	4.7
	43	4.6
	44	9.0
	45	4.6
	46	4.7
	47	4.7
	48	4.7

Circuit No.	Pin No.	Voltage VDC
QA01	B	1.8
	C	8.4
	E	1.2
QA02	B	8.4
	C	4.1
	E	9.0
QA03	B	1.8
	C	8.4
	E	1.2
QA04	B	8.4
	C	4.0
	E	9.0
QA05	B	0
	C	0
	E	0
QA06	B	0
	C	0
	E	0

Circuit No.	Pin No.	Voltage VDC
QC01	B	4.6
	C	9.0
	E	3.9
QC02	B	3.9
	C	9.0
	E	3.2
QC03	B	0
	C	9.0
	E	0.1
QC04	B	5.0
	C	0
	E	0
QC05	B	2.6
	C	9.0
	E	1.9

Circuit No.	Pin No.	Voltage VDC
QY01	B	5.1
	C	9.1
	E	4.4
QY07	B	4.6
	C	9.0
	E	4.0
QY08	B	4.6
	C	9.0
	E	3.9

BASIC CIRCUIT DIAGRAM

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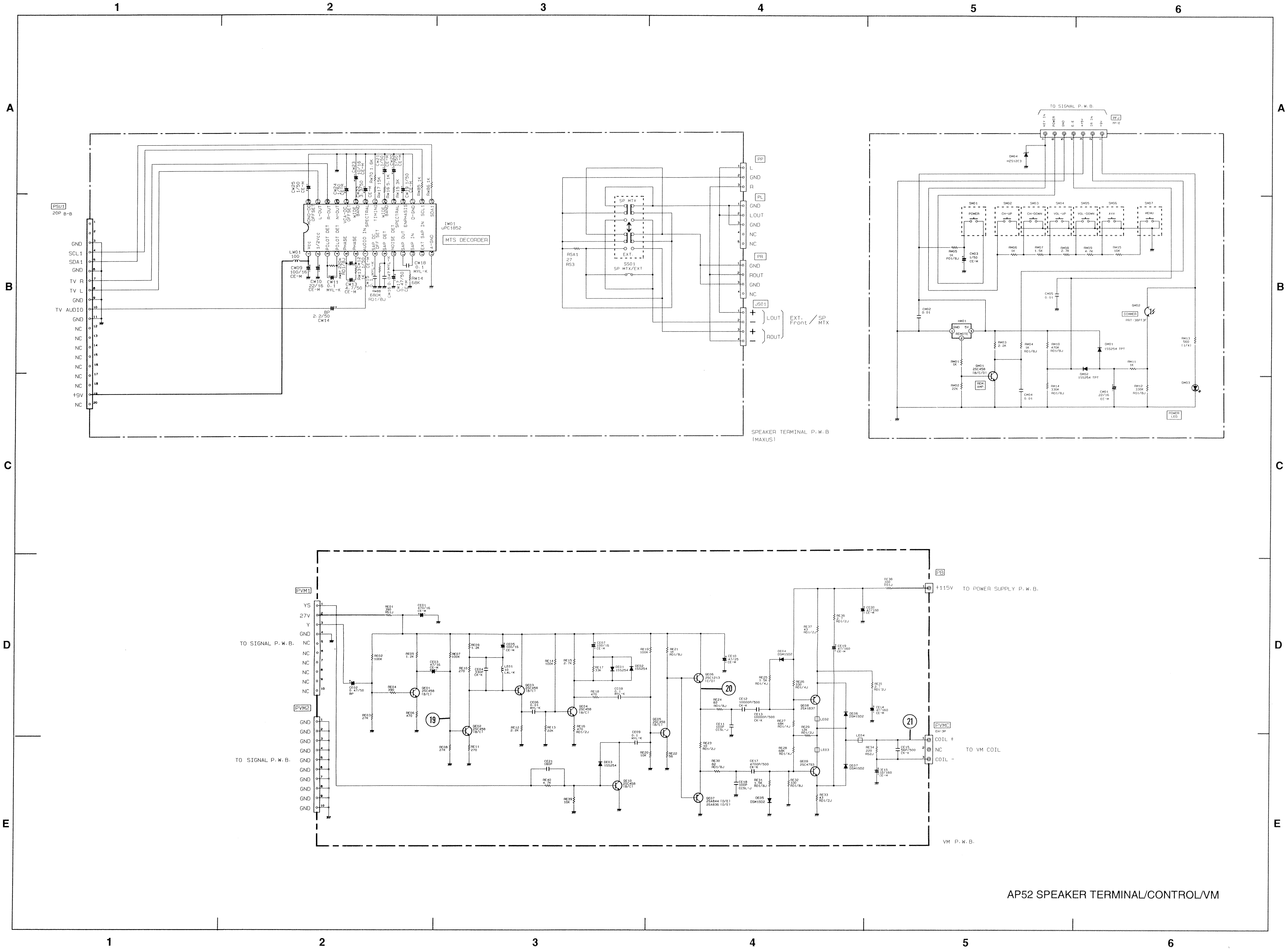

1
2
3
4
5
6
A
B
C
D
E
PSU1
20P B-B
GND
SCL1
SDA1
GND
TV R
TV L
GND
TV AUDIO
GND
NC
+9V
IW01
uPC1852
MTS DECORDER
LW01
100
CW09
100/16
CW14
TO SIGNAL P.W.B
PP
L
GND
R
PL
LOUT
NC
PR
ROUT
JS01
LOUT
ROUT
EXT. Front / SP MTX
RSA1
27
RS3
SP MTX
EXT
SS01
SP MTX/EXT
SPEAKER TERMINAL P.W.B (MAXUS)
PFJ
SM01
POWER
SM02
CH-UP
SM03
CH-DOWN
SM04
VOL-UP
SM05
VOL-DOWN
SM06
SM07
MENU
IM01
GND
5V
REMOTE
QM01
2SC458
QM02
DIMMER
POWER LED
PVM1
YS
27V
Y
GND
NC
TO SIGNAL P.W.B.
PVM2
GND
TO SIGNAL P.W.B.
PB
+115V
TO POWER SUPPLY P.W.B.
PVMC
COIL +
NC
COIL -
TO VM COIL
19
20
21
VM P.W.B.

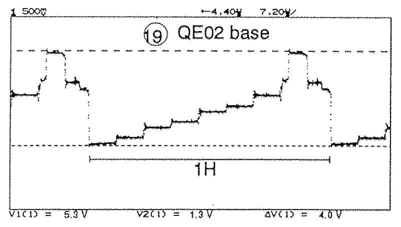
AP52 SPEAKER TERMINAL/CONTROL/VM

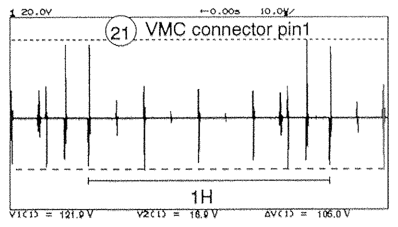
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

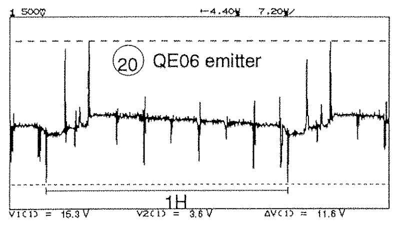
Circuit No.	Pin No.	Voltage VDC
IW01	1	9.0
	2	4.5
	3	4.5
	4	4.6
	5	4.6
	6	4.6
	7	4.5
	8	4.5
	9	5.6
	10	0.1
	11	3.4
	12	4.5
	13	4.5
	14	0
	15	5.1
	16	5.1
	17	0
	18	4.7
	19	4.6
	20	4.7
	21	1.2
	22	5.1
	23	5.2
	24	4.5
	25	4.6
	26	4.6
	27	4.6
	28	4.8

Circuit No.	Pin No.	Voltage VDC
QE01	B	2.8
	C	9.9
	E	2.2
QE02	B	2.6
	C	6.8
	E	1.9
QE03	B	6.8
	C	15.4
	E	6.1
QE04	B	2.4
	C	5.6
	E	1.7
QE05	B	1.1
	C	8.0
	E	0.4
QE06	B	7.9
	C	15.4
	E	8.0
QE07	B	8.0
	C	0
	E	8.0
QE08	B	112.4
	C	39.9
	E	112.5
QE09	B	0.2
	C	38.3
	E	0.2
QE10	B	0
	C	0
	E	0

Circuit No.	Pin No.	Voltage VDC
QM01	B	0.7
	C	0.1
	E	0
QM02	B	---
	C	1.6
	E	9.1


⑲ QE02 base


㉑ VMC connector pin1


⑳ QE06 emitter

BASIC CIRCUIT DIAGRAM

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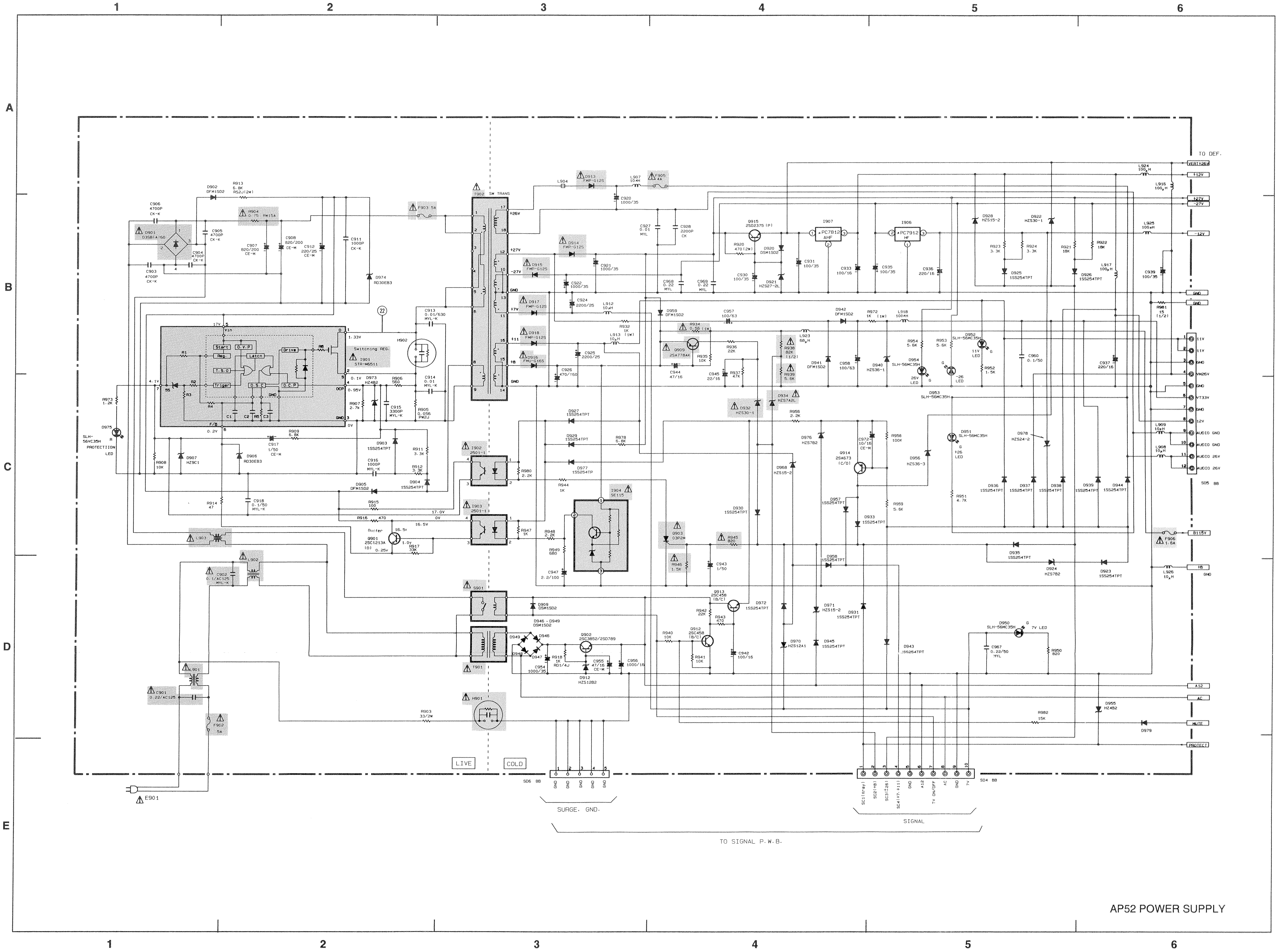
1
2
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5
6
A
B
C
D
E
TO DEF.
SW TRANS
Switching REG
I901 STR-M6511
SLH-56YC35H PROTECTION LED
LIVE
COLD
SURGE, GND.
SIGNAL
TO SIGNAL P.W.B.
SD6 B8
SD4 B8
SD5 B8
E901
AP52 POWER SUPPLY

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
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Circuit No.	Pin No.	Voltage VDC
I901	1	1.33
	2	0.1
	3	0
	4	0.95
	5	17.0
	6	0.2
	7	4.1

Circuit No.	Pin No.	Voltage VDC
I902	1	20.0
	2	20.0
	3	17.0
	4	0

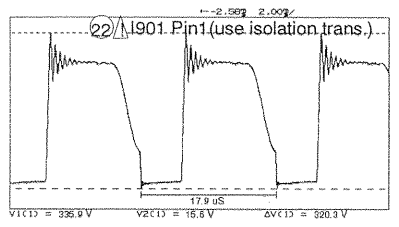
Circuit No.	Pin No.	Voltage VDC
I903	1	20.0
	2	19.1
	3	16.5
	4	1.0

Circuit No.	Pin No.	Voltage VDC
I904	1	115.1
	2	17.0
	3	0

Circuit No.	Pin No.	Voltage VDC
I906	1	0
	2	-26.8
	3	-12.2

Circuit No.	Pin No.	Voltage VDC
I907	1	25.8
	2	0
	3	11.8

Circuit No.	Pin No.	Voltage VDC
Q901	B	1.0
	C	16.5
	E	0.25
Q902	B	12.9
	C	18.1
	E	12.4
Q903	K	0
	A	20.0
	G	0.1
Q909	B	65.0
	C	0.1
	E	115.1
Q912	B	0.1
	C	12.2
	E	0
Q913	B	0.1
	C	12.4
	E	11.6
Q914	B	6.7
	C	0
	E	7.0
Q915	B	26.5
	C	27.1
	E	25.9



BASIC CIRCUIT DIAGRAM

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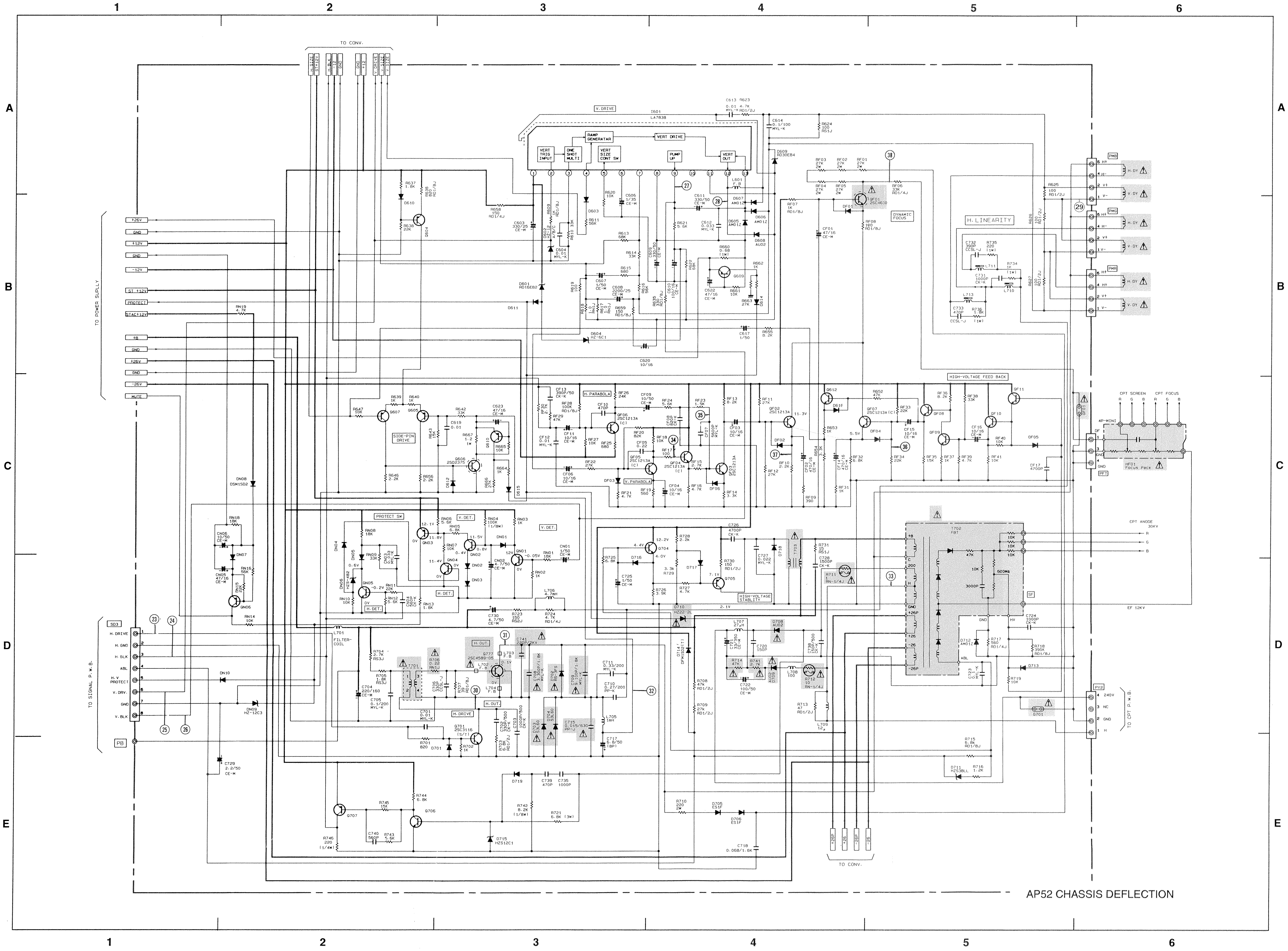
1
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3
4
5
6
A
B
C
D
E
TO CONV.
TO POWER SUPPLY
+26V
GND
+12V
GND
-12V
ST +12V
PROTECT
STAC+12V
+B
GND
+26V
GND
-26V
MUTE
TO SIGNAL P.W.B.
SD3
H.DRIVE
H.GND
H.BLK
ABL
H.V PROTECT
V.DRV.
GND
V.BLK
PB
I601 LA7838
VERT TRIG INPUT
ONE SHOT MULTI
RAMP GENERATOR
VERT SIZE CONT SW
VERT DRIVE
PUMP UP
VERT OUT
V.DRIVE
DYNAMIC FOCUS
H.LINEARITY
H.DY
V.DY
HIGH-VOLTAGE FEED BACK
SIDE-PIN DRIVE
V.PARABOLA
H.PARABOLA
PROTECT SW
V.DET.
H.DET
H.OUT
H.DRIVE
HIGH-VOLTAGE STABILITY
T702 FBT
CPT SCREEN
CPT FOCUS
HF01 Focus Pack
CPT ANODE 30KV
EF 12KV
TO CPT P.W.B.
245V
NC
GND
H
AP52 CHASSIS DEFLECTION

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
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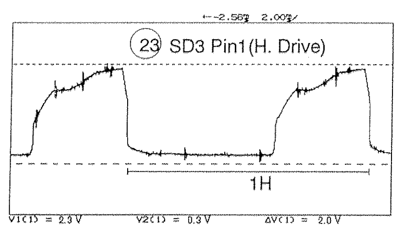
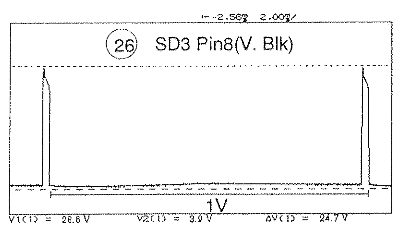
Circuit No.	Pin No.	Voltage VDC
I601	1	10.9
	2	4.4
	3	5.4
	4	5.6
	5	0
	6	5.1
	7	5.6
	8	25.6
	9	1.6
	10	1.3
	11	0
	12	13.0
	13	25.3

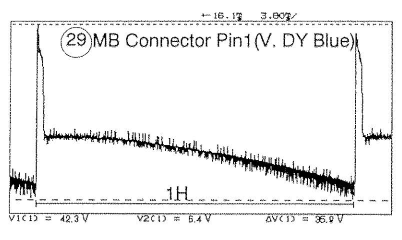
Circuit No.	Pin No.	Voltage VDC
Q604	B	10.3
	C	4.7
	E	10.9
Q605	B	3.6
	C	1.1
	E	4.2
Q606	B	0.5
	C	15.4
	E	0
Q607	B	3.7
	C	1.0
	E	4.2
Q609	B	0
	C	0
	E	25.9
Q610	B	15.4
	C	0
	E	15.7
Q612	B	4.2
	C	11.7
	E	3.6
Q701	B	0.3
	C	35.0
	E	0
Q704	B	4.4
	C	11.7
	E	3.8
Q705	B	6.0
	C	2.3
	E	6.7
Q706	B	-0.4
	C	9.5
	E	0

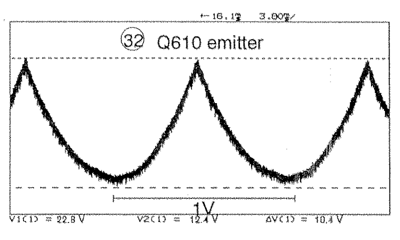
Circuit No.	Pin No.	Voltage VDC
Q707	B	12.7
	C	2.3
	E	11.7
Q777	B	0
	C	113.3
	E	0
QF01	B	11.6
	C	617.8
	E	11.1
QF02	B	5.9
	C	10.8
	E	5.6
QF03	B	2.5
	C	7.2
	E	1.9
QF04	B	3.1
	C	11.7
	E	2.5
QF05	B	1.1
	C	3.1
	E	0.5
QF06	B	-11.1
	C	-5.2
	E	-11.6
QF07	B	5.8
	C	10.8
	E	5.3
QF08	B	5.0
	C	11.7
	E	4.4
QF09	B	1.5
	C	5.0
	E	0.8

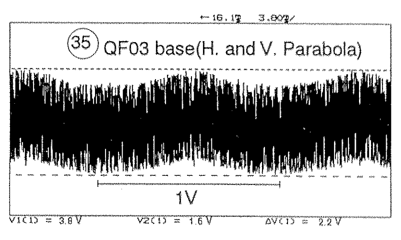
Circuit No.	Pin No.	Voltage VDC
QF10	B	10.5
	C	11.7
	E	9.9
QF11	B	10.9
	C	11.7
	E	10.5
QN01	B	0
	C	11.5
	E	0
QN02	B	0.9
	C	12.4
	E	0.5
QN03	B	12.4
	C	-0.5
	E	12.4
QN04	B	0
	C	12.4
	E	0
QN05	B	-0.2
	C	0.6
	E	0
QN06	B	10.0
	C	-0.5
	E	10.1

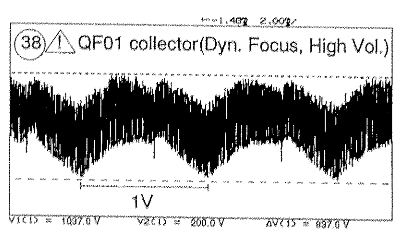

㉓ SD3 Pin1(H. Drive)

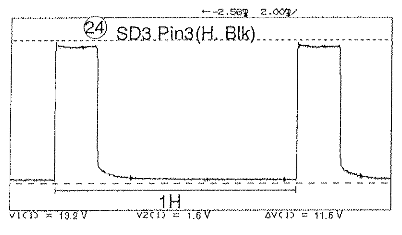

㉖ SD3 Pin8(V. Blk)

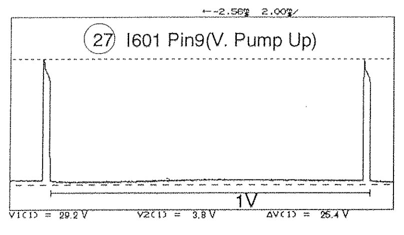

㉙ MB Connector Pin1(V. DY Blue)

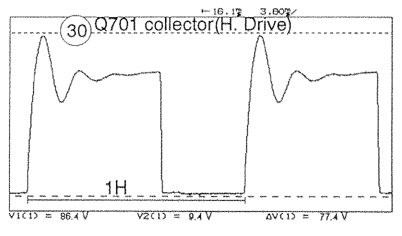

㉜ Q610 emitter

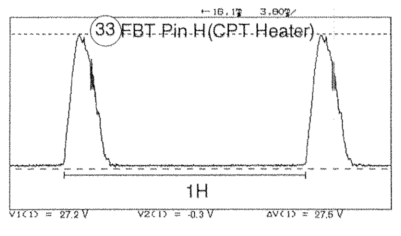

㉟ QF03 base(H. and V. Parabola)

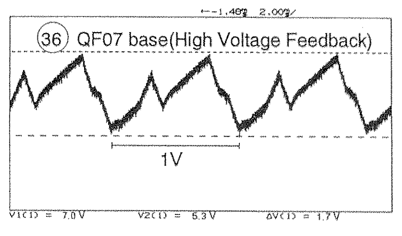

㊳ ⚠ QF01 collector(Dyn. Focus, High Vol.)

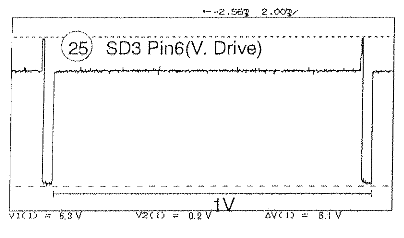

㉔ SD3 Pin3(H. Blk)

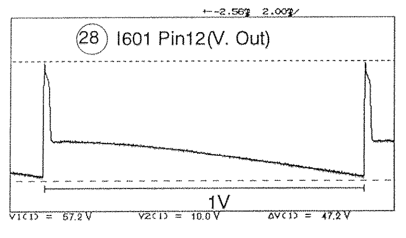

㉗ I601 Pin9(V. Pump Up)

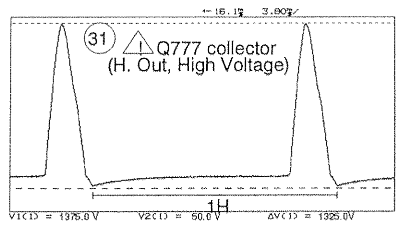

㉚ Q701 collector(H. Drive)

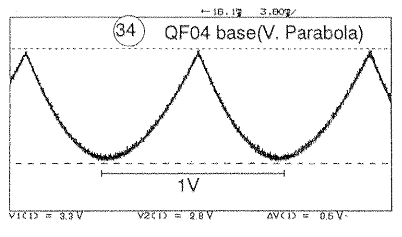

㉝ FBT Pin H(CPT Heater)

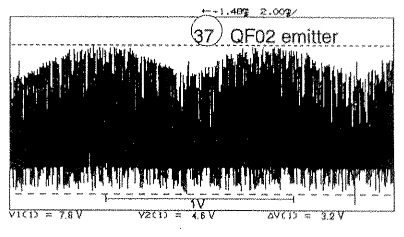

㊱ QF07 base(High Voltage Feedback)


㉕ SD3 Pin6(V. Drive)


㉘ I601 Pin12(V. Out)


㉛ ⚠ Q777 collector (H. Out, High Voltage)


㉞ QF04 base(V. Parabola)


㊲ QF02 emitter

BASIC CIRCUIT DIAGRAM

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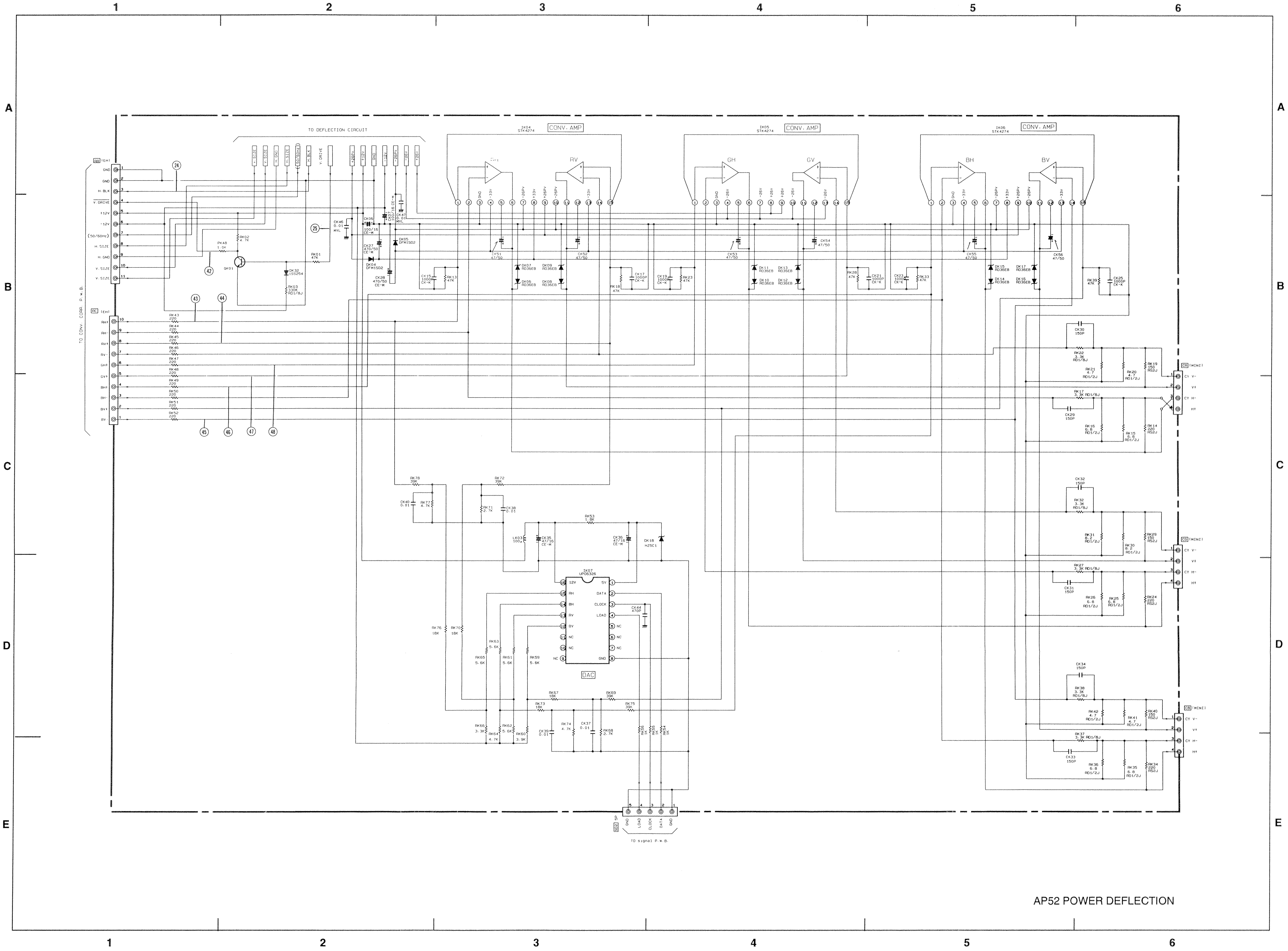

1
2
3
4
5
6
A
B
C
D
E
TO DEFLECTION CIRCUIT
IK04 STK4274
IK05 STK4274
IK06 STK4274
CONV. AMP
RH
RV
GH
GV
BH
BV
GND
H.BLK
V.DRIVE
+12V
-12V
(50/60Hz)
H.SIZE
H.GND
V.SIZE
TO CONV. CONR. P.W.B.
RH+
RH-
RV+
RV-
GH+
GV+
BH+
BH-
BV+
BV-
QK01
IK07 UPD6326
DAC
12V
5V
DATA
CLOCK
LOAD
NC
GND
CY V-
CY V+
CY H-
CY H+
TO signal P.W.B.
AP52 POWER DEFLECTION

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

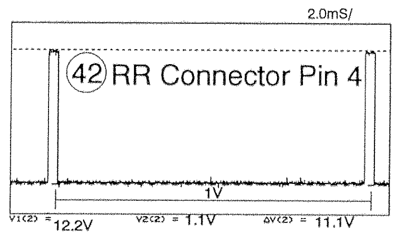
Circuit No.	Pin No.	Voltage VDC
IK04	1	-0.4
	2	-0.4
	3	0
	4	-33.0
	5	-22.3
	6	-0.3
	7	-26.7
	8	31.1
	9	27.0
	10	-26.7
	11	0
	12	-22.4
	13	-33.0
	14	0
	15	0

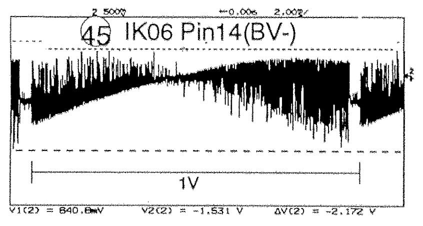
Circuit No.	Pin No.	Voltage VDC
IK05	1	-0.2
	2	-0.2
	3	0
	4	-33.0
	5	-19.7
	6	-0.2
	7	-26.8
	8	31.0
	9	27.0
	10	-26.8
	11	0
	12	-22.9
	13	-33.1
	14	0
	15	0

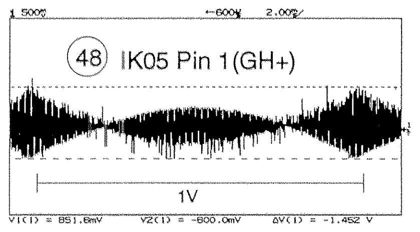
Circuit No.	Pin No.	Voltage VDC
IK06	1	-0.4
	2	-0.4
	3	0
	4	-33.0
	5	-22.6
	6	-0.5
	7	-26.7
	8	31.1
	9	31.1
	10	-26.7
	11	-0.1
	12	-22.4
	13	-33.0
	14	-0.1
	15	-0.1

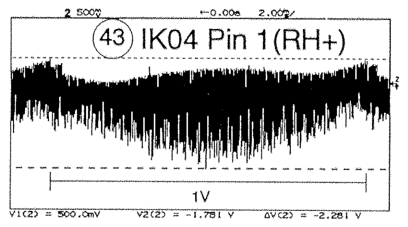
Circuit No.	Pin No.	Voltage VDC
IK07	1	5.0
	2	5.2
	3	5.1
	4	0
	5	0
	6	4.0
	7	0
	8	0
	9	0
	10	0
	11	0
	12	5.3
	13	5.3
	14	5.3
	15	5.3
	16	11.8

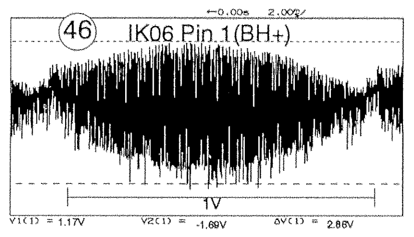
Circuit No.	Pin No.	Voltage VDC
QK01	B	0.6
	C	0.3
	E	0

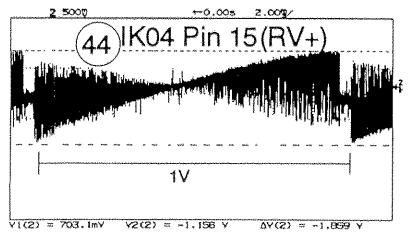


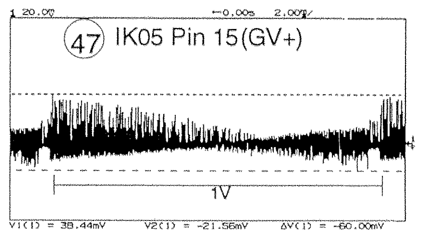






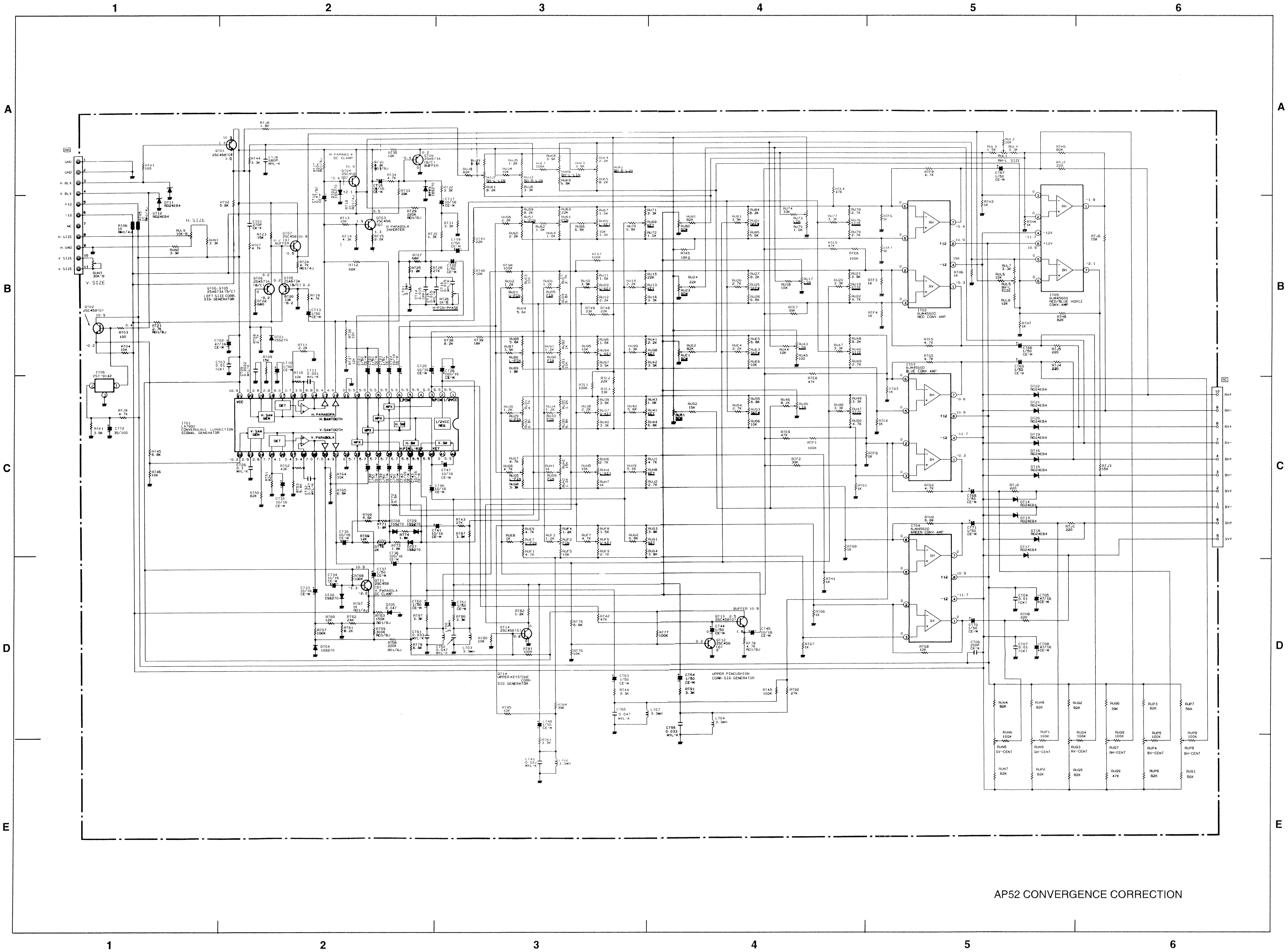






BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
H-SIZE
V-SIZE
IT01 LA7990 CONVERGENCE CORRECTION SIGNAL GENERATOR
IT02 NJM4560D RED CONV. AMP
IT03 NJM4560D BLUE CONV. AMP
IT04 NJM4560D GREEN CONV. AMP
IT05 NJM4560D RED/BLUE HORIZ CONV. AMP
QT14 UPPER KEYSTONE CORR. SIG. GENERATOR
UPPER PINCUSHION CORR. SIG. GENERATOR
BUFFER

AP52 CONVERGENCE CORRECTION

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IT01	1	5.5
	2	5.5
	3	5.5
	4	5.5
	5	5.5
	6	5.5
	7	5.5
	8	5.5
	9	5.5
	10	5.5
	11	0
	12	4.4
	13	6.4
	14	6.8
	15	3.6
	16	3.7
	17	8.0
	18	2.8
	19	2.8
	20	0
	21	10.9

Circuit No.	Pin No.	Voltage VDC
IT01	22	-0.2
	23	2.9
	24	2.8
	25	7.7
	26	4.1
	27	3.4
	28	3.4
	29	7.0
	30	7.0
	31	4.9
	32	0
	33	5.7
	34	5.7
	35	5.7
	36	5.7
	37	5.7
	38	5.5
	39	5.5
	40	5.5
	41	0
	42	5.5

Circuit No.	Pin No.	Voltage VDC
IT02	1	-0.3
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	-0.4
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT03	1	-0.3
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	-0.6
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT04	1	0
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	0
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT05	1	-1.9
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	-2.1
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT06	1	0.4
	2	4.8
	3	0

Circuit No.	Pin No.	Voltage VDC
QT01	B	1.4
	C	10.9
	E	1.0
QT02	B	0.4
	C	10.9
	E	-0.2
QT03	B	1.9
	C	5.5
	E	1.3
QT04	B	-1.4
	C	10.9
	E	-2.1
QT05	B	0.2
	C	-8.2
	E	0.2
QT06	B	0
	C	-8.2
	E	0.2

Circuit No.	Pin No.	Voltage VDC
QT07	B	0.2
	C	10.9
	E	-0.5
QT08	B	-0.4
	C	0
	E	0.2
QT11	B	-1.3
	C	10.9
	E	-2.0
QT12	B	0.2
	C	0
	E	0
QT13	B	2.5
	C	10.9
	E	1.8
QT14	B	0.2
	C	0
	E	0

BASIC CIRCUIT DIAGRAM

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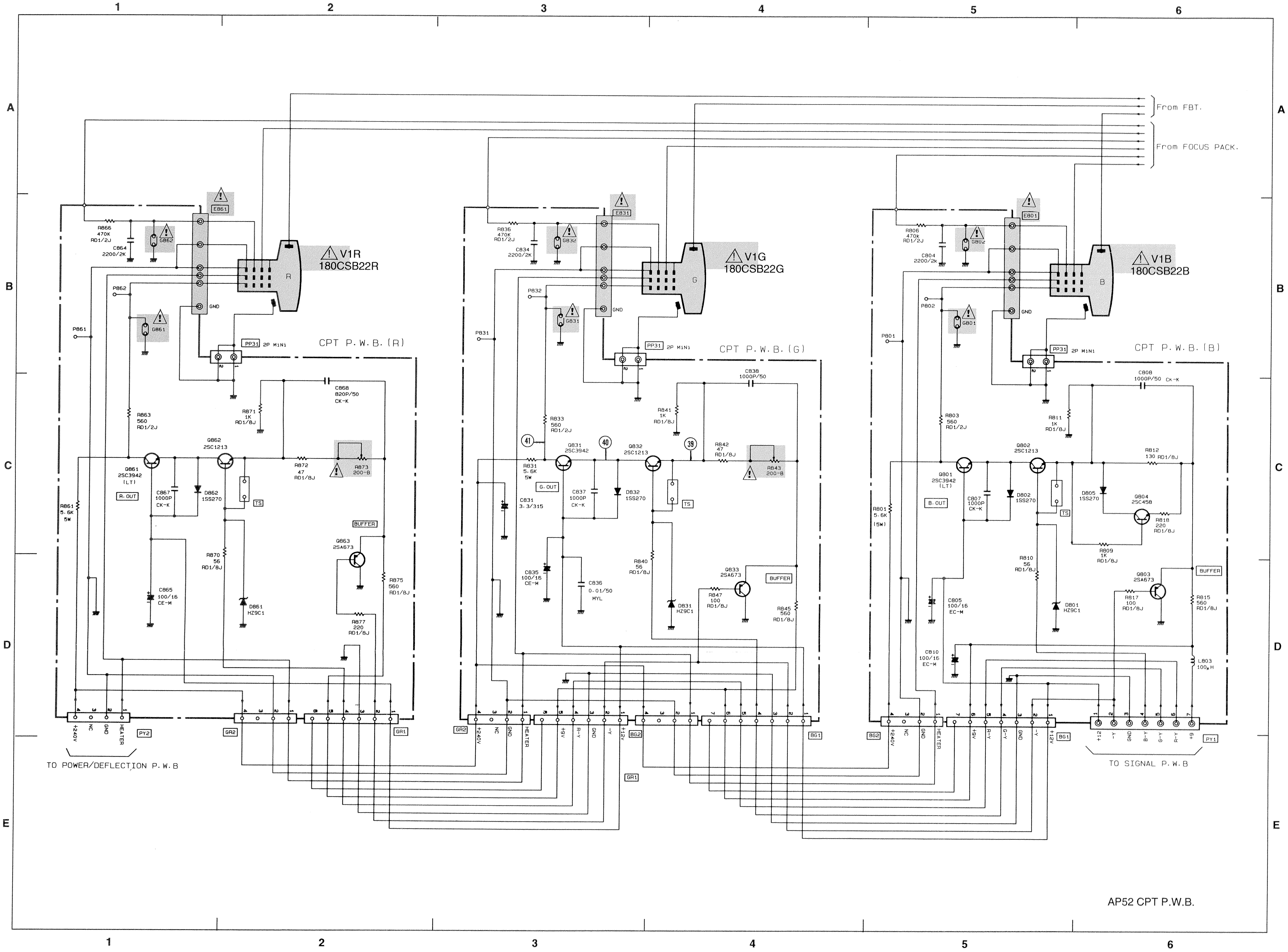
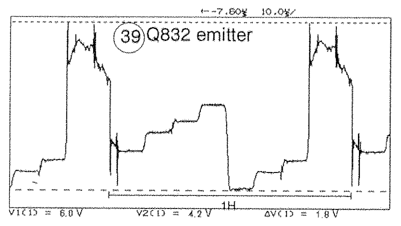

1
2
3
4
5
6
A
B
C
D
E
From FBT.
From FOCUS PACK.
E861
R866 470K RD1/2J
C864 2200/2K
G862
V1R 180CSB22R
R
GND
P862
P861
G861
PP31 2P MiNi
CPT P.W.B. (R)
C868 820P/50 CK-K
R871 1K RD1/8J
R863 560 RD1/2J
Q862 2SC1213
Q861 2SC3942 (LT)
R872 47 RD1/8J
R873 200-B
R.OUT
C867 1000P CK-K
D862 1SS270
TS
R861 5.6K 5W
BUFFER
Q863 2SA673
R870 56 RD1/8J
R875 560 RD1/8J
C865 100/16 CE-M
D861 HZ9C1
R877 220 RD1/8J
+240V
NC
GND
HEATER
PY2
GR2
GR1
TO POWER/DEFLECTION P.W.B
E831
R836 470K RD1/2J
C834 2200/2K
G832
V1G 180CSB22G
G
P832
G831
P831
CPT P.W.B. (G)
C838 1000P/50
R841 1K RD1/8J
R833 560 RD1/2J
41
40
39
Q831 2SC3942
Q832 2SC1213
R842 47 RD1/8J
R843 200-B
R831 5.6K 5W
G.OUT
C831 3.3/315
C837 1000P CK-K
D832 1SS270
C835 100/16 CE-M
C836 0.01/50 MYL
R840 56 RD1/8J
Q833 2SA673
BUFFER
D831 HZ9C1
R847 100 RD1/8J
R845 560 RD1/8J
+9V
R-Y
GND
-Y
+12V
BG2
BG1
E801
R806 470k RD1/2J
C804 2200/2k
G802
V1B 180CSB22B
B
P802
G801
P801
CPT P.W.B. (B)
C808 1000P/50 CK-K
R811 1K RD1/8J
R803 560 RD1/2J
Q802 2SC1213
R812 130 RD1/8J
Q801 2SC3942 (LT)
B.OUT
C807 1000P CK-K
D802 1SS270
D805 1SS270
Q804 2SC458
R801 5.6K (5W)
R818 220 RD1/8J
R809 1K RD1/8J
R810 56 RD1/8J
Q803 2SA673
BUFFER
R817 100 RD1/8J
R815 560 RD1/8J
C805 100/16 EC-M
D801 HZ9C1
C810 100/16 EC-M
L803 100µH
+12
-Y
GND
B-Y
G-Y
R-Y
+9
PY1
TO SIGNAL P.W.B
AP52 CPT P.W.B.

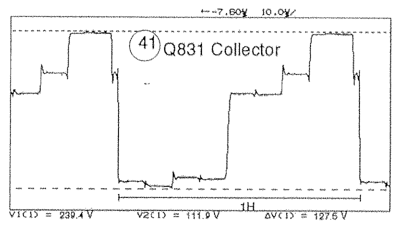
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
Q801	B	11.8
	C	172.8
	E	11.2
Q802	B	5.3
	C	11.2
	E	4.9
Q803	B	4.1
	C	0
	E	4.2
Q804	B	4.8
	C	4.5
	E	4.6
Q831	B	11.8
	C	175.8
	E	11.3

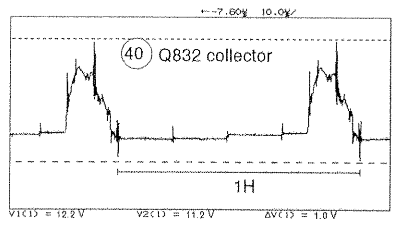
Circuit No.	Pin No.	Voltage VDC
Q832	B	5.2
	C	11.2
	E	4.8
Q833	B	4.1
	C	0
	E	4.2
Q861	B	11.8
	C	191.2
	E	11.2
Q862	B	5.1
	C	11.2
	E	4.7
Q863	B	4.1
	C	0
	E	4.2



㊴ Q832 emitter



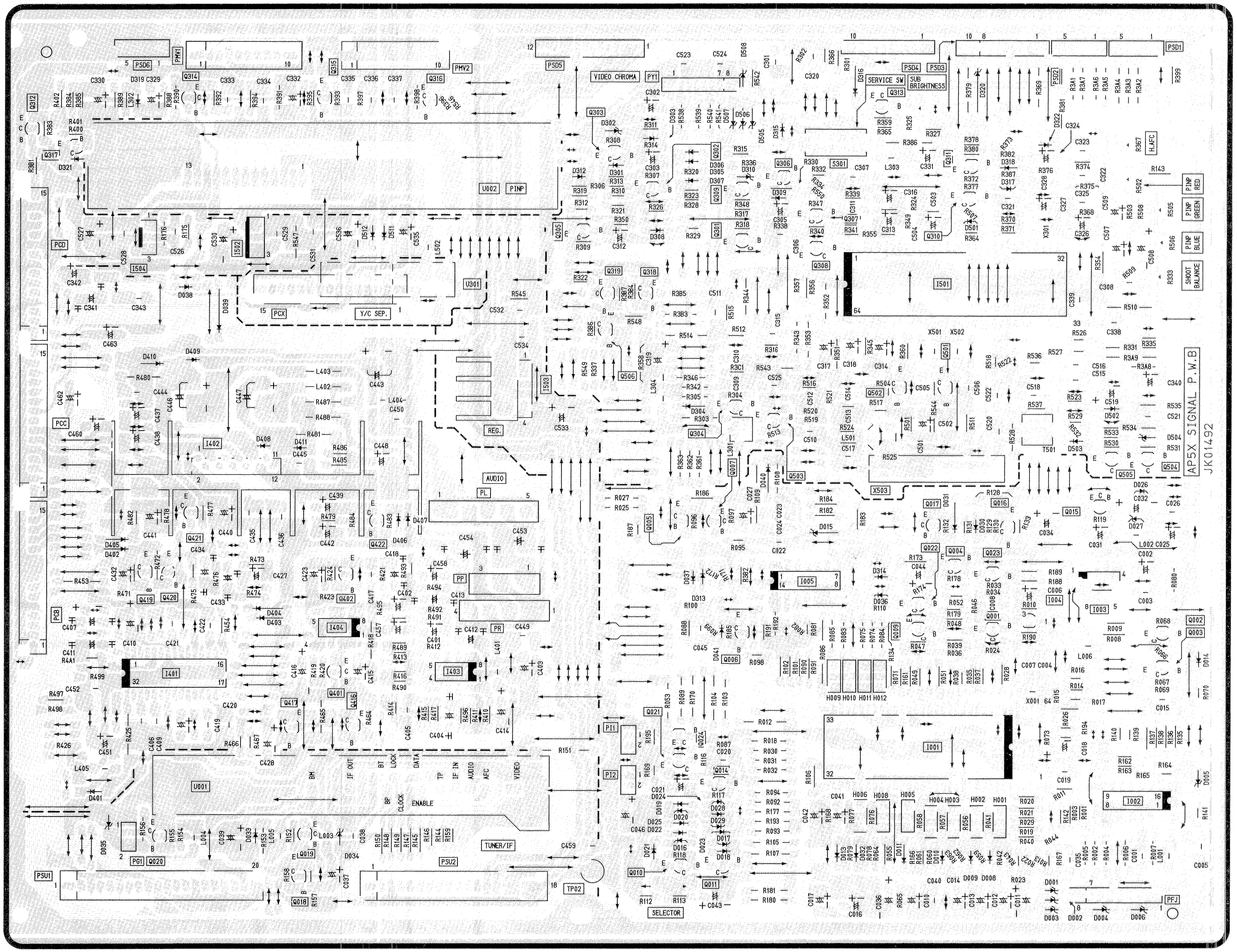
㊶ Q831 Collector



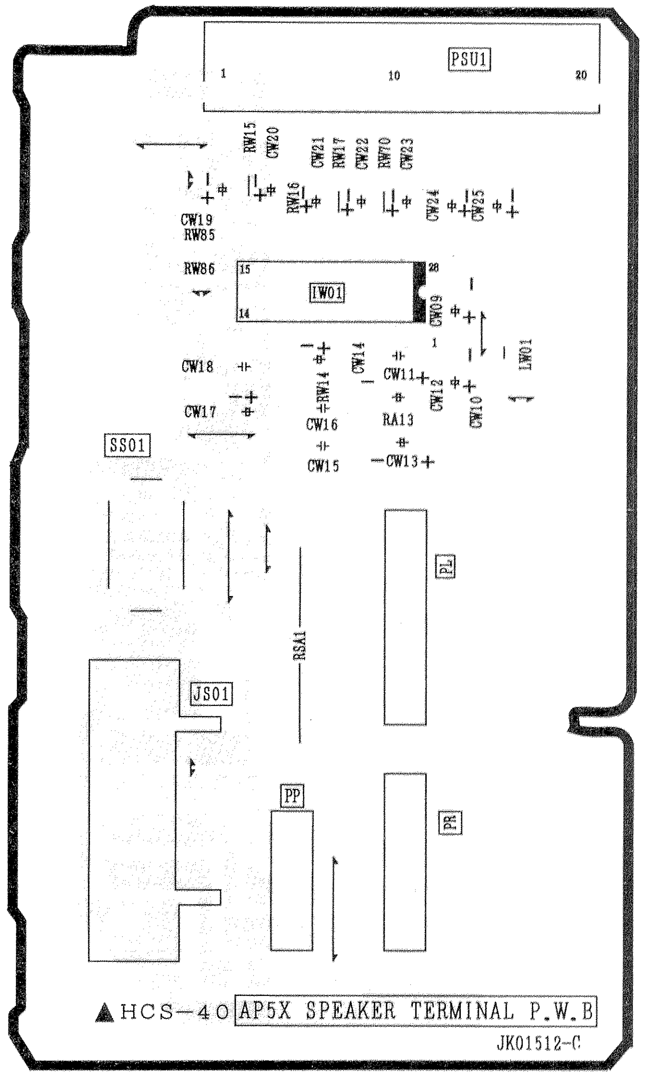
㊵ Q832 collector

PRINTED CIRCUIT BOARD

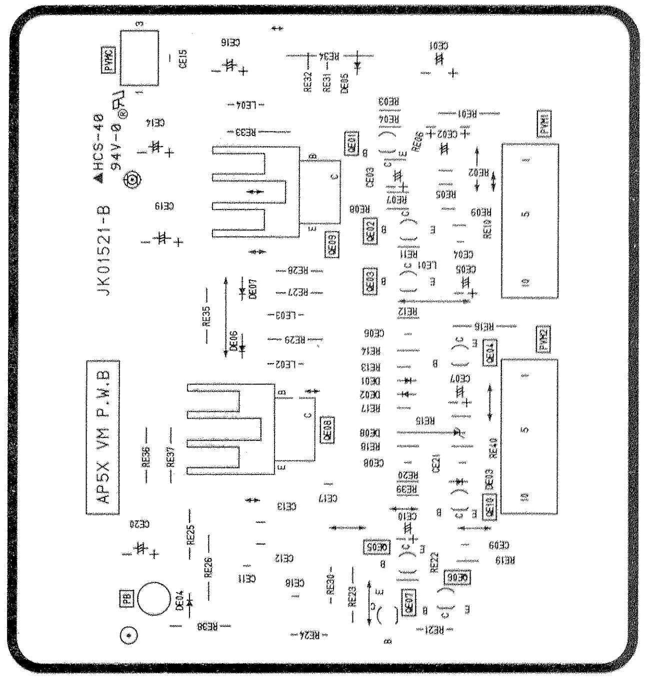
SIGNAL P.C.B.


AP5X SIGNAL P.W.B
JK01492

SPEAKER TERMINAL P.C.B.

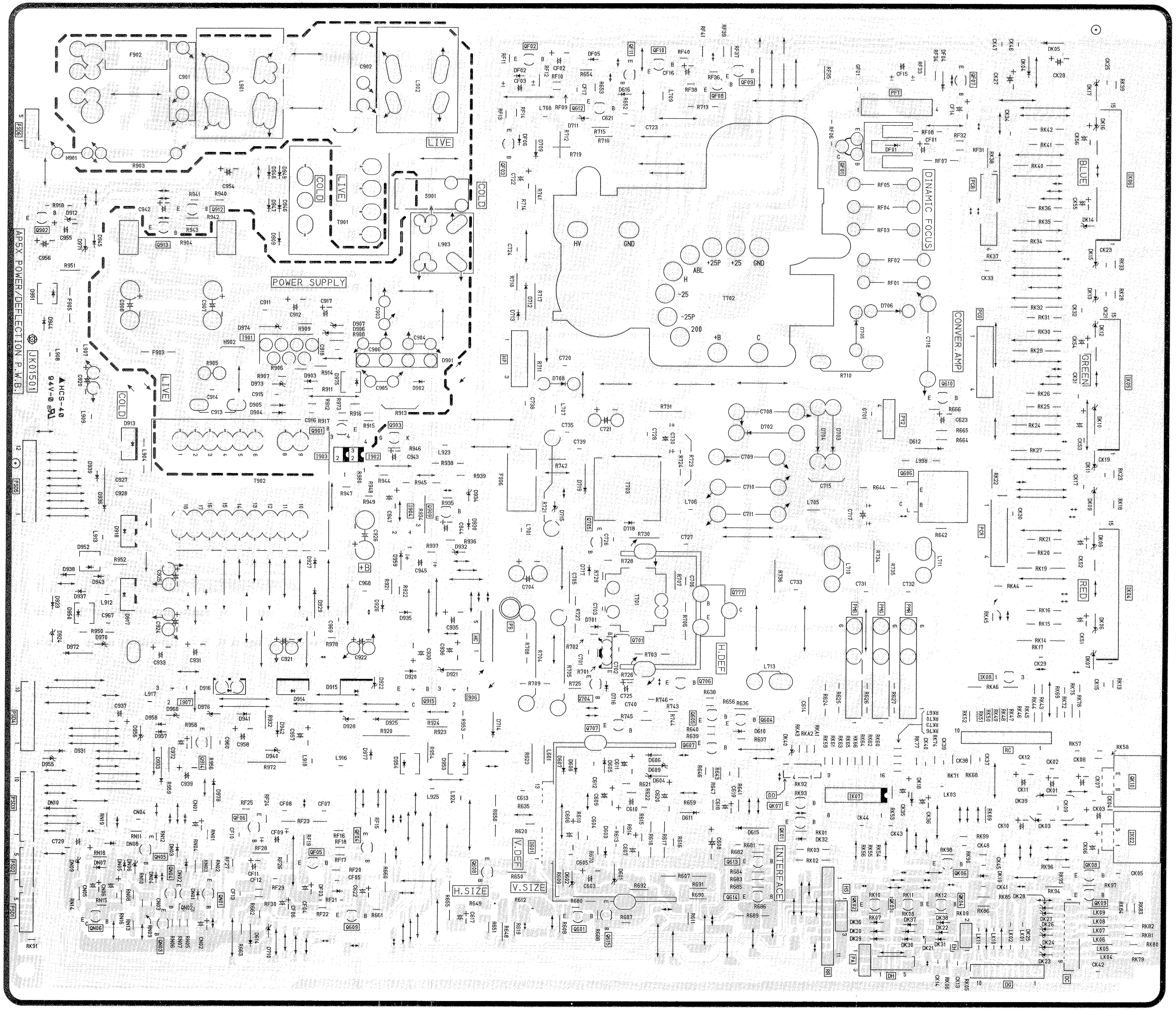

▲HCS-40
AP5X SPEAKER TERMINAL P.W.B
JK01512-C

VM P.C.B.

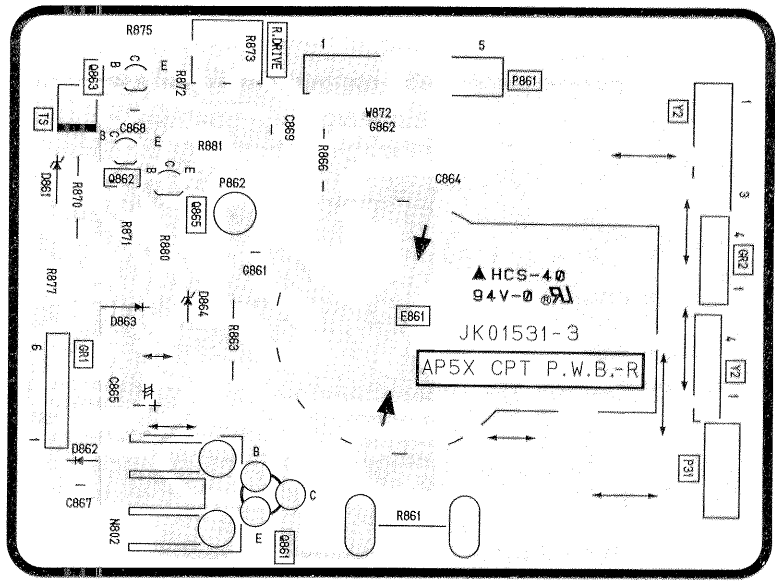

▲HCS-40
94V-0
JK01521-B
AP5X VM P.W.B

PRINTED CIRCUIT BOARD

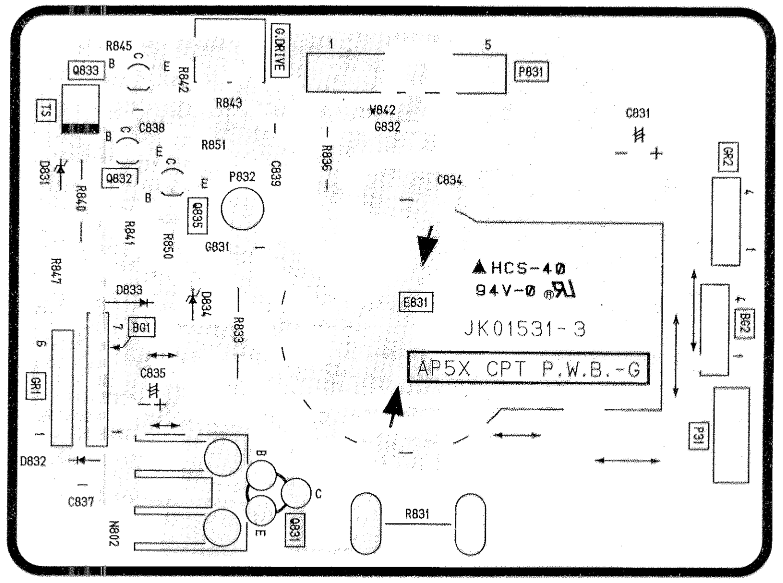
POWER/DEFLECTION P.C.B.


AP5X POWER/DEFLECTION P.W.B.
JK01501
▲HCS-40
94V-0
POWER SUPPLY
LIVE
COLD
HV
GND
ABL
+25P
+25
-25
-25P
200
+B
T702
DINAMIC FOCUS
CONVER.AMP
BLUE
GREEN
RED
H.DEF
H.SIZE
V.SIZE
V.DEF
INTERFACE

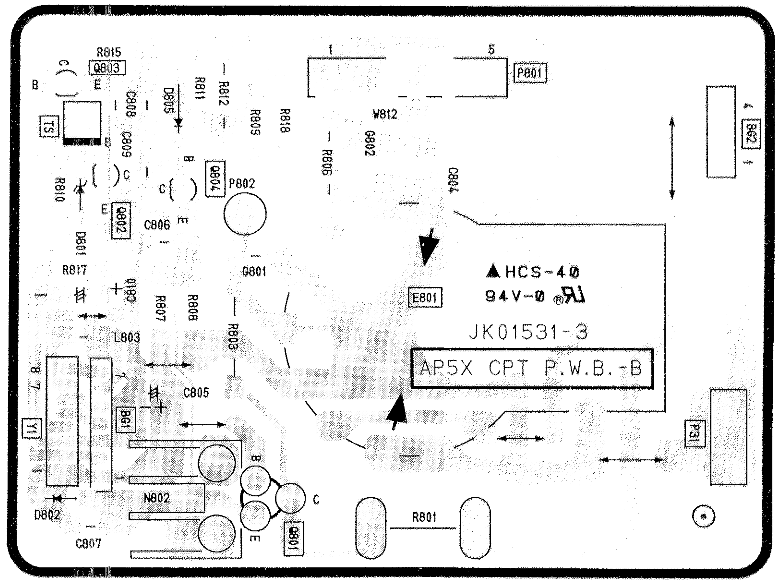
RED CPT P.C.B.


R.DRIVE
▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-R

GREEN CPT P.C.B.

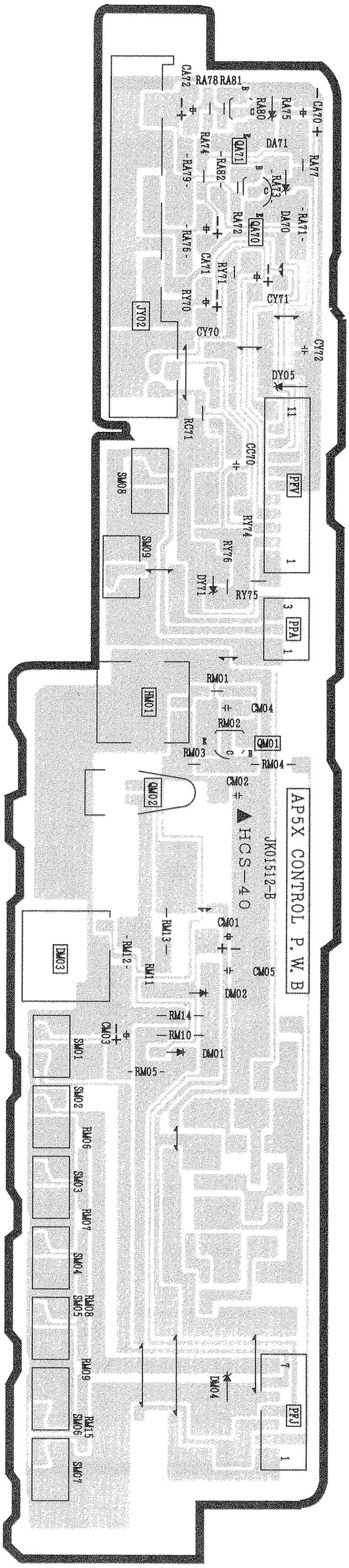

G.DRIVE
▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-G

BLUE CPT P.C.B.


▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-B

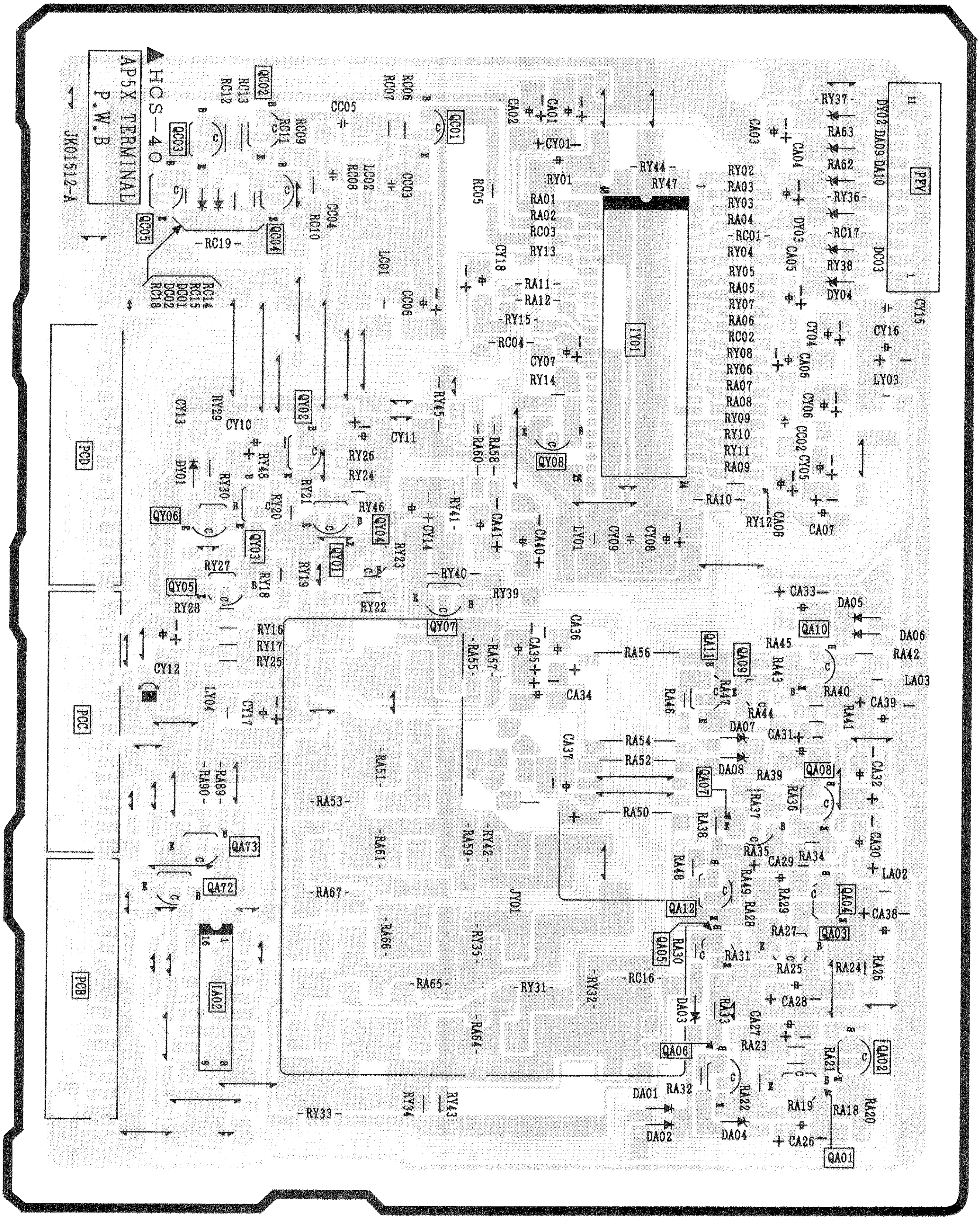
PRINTED CIRCUIT BOARD

CONTROL P.C.B.


AP5X CONTROL P. W. B
JK01512-B
HCS-40
CA72
RA78
RA81
RA80
RA75
CA70
RA74
QA71
DA71
RA77
RA79
RA82
RA73
RA71
RA76
RA72
QA70
DA70
CA71
RY71
CY71
RY70
JY02
CY70
CY72
DY05
11
RC71
CC70
PFV
SM08
RY74
SM09
RY76
1
DY71
RY75
3
PPA
1
RM01
HM01
CM04
RM02
QM01
RM03
RM04
QM02
CM02
RM13
CM01
DM03
RM12
RM11
CM05
DM02
RM14
CM03
RM10
SM01
DM01
RM05
SM02
RM06
SM03
RM07
SM04
RM08
SM05
RM09
DM04
7
PFJ
RM15
SM06
1
SM07

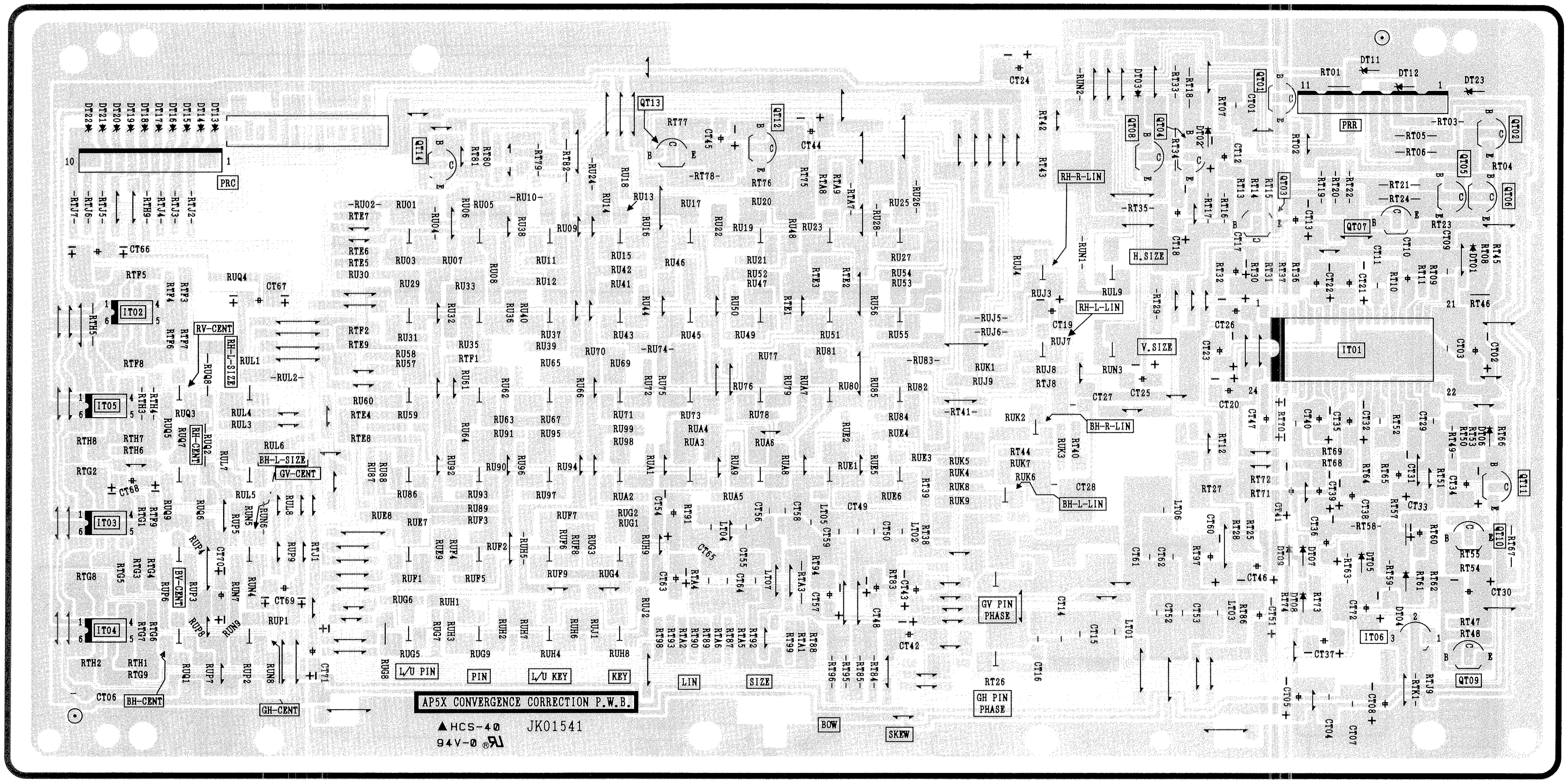
PRINTED CIRCUIT BOARD

TERMINAL P.C.B.

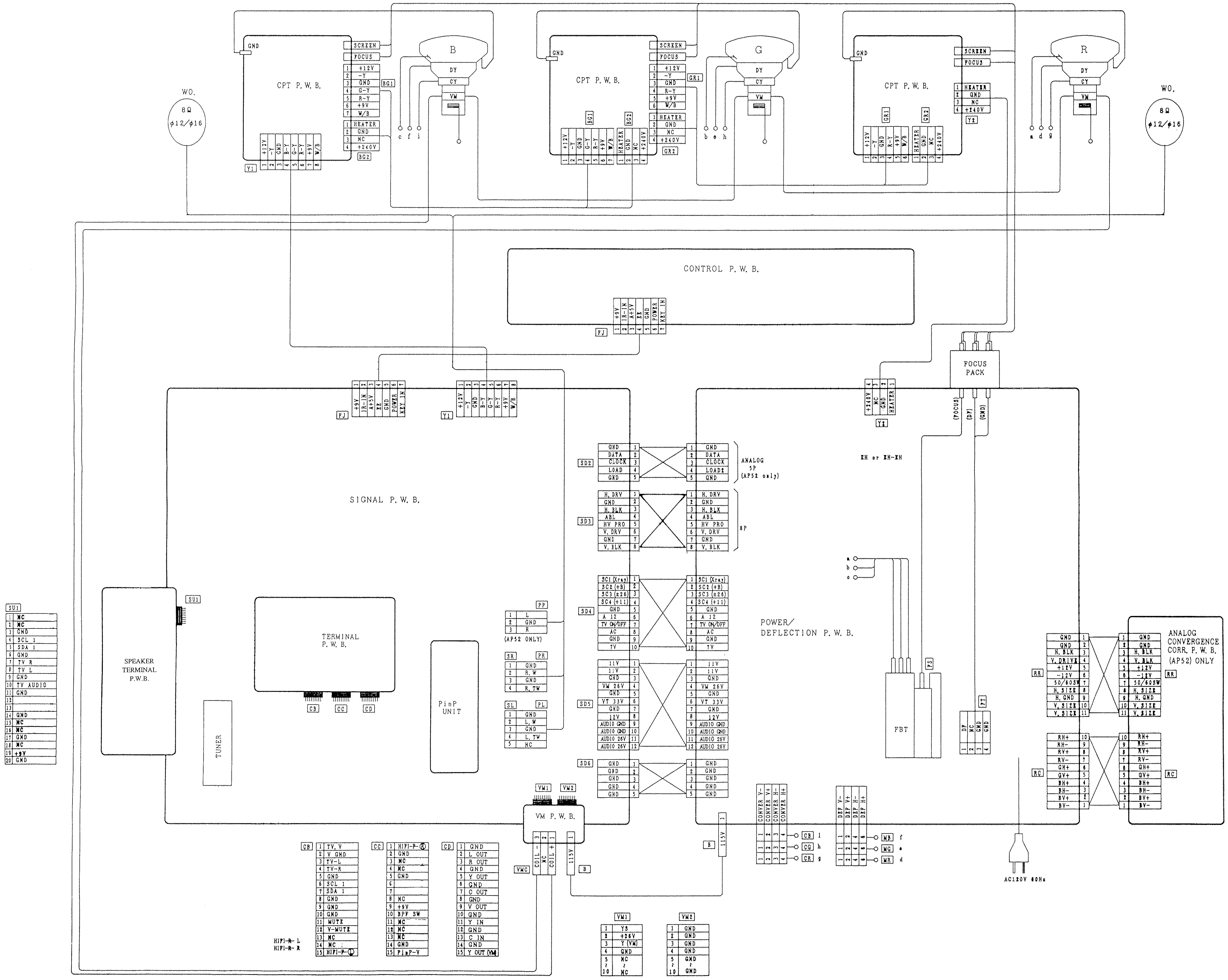

AP5X TERMINAL
P.W.B
HCS-40
JK01512-A
QC02
QC03
QC04
QC05
QC01
RC13
RC12
RC09
RC11
CC05
RC06
RC07
RC08
LC02
CC03
CC04
RC10
RC05
RC19
RC14
RC15
DC01
DC02
RC18
LC01
CC06
CA02
CA01
CY01
RY01
RA01
RA02
RC03
RY13
CY18
RA11
RA12
RY15
RC04
CY07
RY14
RY44
RY47
IY01
RY02
RA03
RY03
RA04
RC01
RY04
RY05
RA05
RY07
RA06
RC02
RY08
RY06
RA07
RA08
RY09
RY10
RY11
RA09
RA10
RY12
CA08
CA07
CA03
CA04
DY03
CA05
CY04
CA06
CY06
CC02
CY05
RY37
RA63
RA62
RY36
RC17
RY38
DY04
DY02
DA09
DA10
DC03
PFV
CY15
CY16
LY03
PCD
CY13
RY29
CY10
QY02
CY11
RY45
RA58
RA60
QY08
RY26
RY24
RY48
RY21
DY01
RY30
RY20
RY46
QY06
QY04
QY03
QY01
RY41
CY14
CA41
CA40
LY01
CY09
CY08
RY27
RY18
RY19
RY23
RY40
QY05
RY28
RY22
RY39
QY07
RY16
RY17
RY25
CY12
PCC
LY04
CY17
RA55
RA57
CA35
CA36
CA34
RA56
QA11
QA09
RA45
RA43
QA10
CA33
DA05
DA06
RA42
LA03
RA40
CA39
RA41
RA46
RA47
RA44
DA07
CA31
CA37
RA54
RA52
DA08
RA39
QA08
CA32
RA89
RA90
RA51
RA53
QA07
RA37
RA36
RA50
RA38
RA35
CA29
RA34
CA30
QA73
RA61
RY42
RA59
RA48
RA49
RA28
RA29
LA02
QA72
RA67
JY01
QA12
QA04
CA38
PCB
IA02
RA66
RY35
QA05
RA30
RA31
RA27
QA03
RA25
RA24
RA26
RA65
RY31
RY32
RC16
DA03
RA33
CA28
CA27
RA64
QA06
RA23
RA21
QA02
DA01
RA32
RA22
RA19
RA18
RA20
RY33
RY34
RY43
DA02
DA04
CA26
QA01

PRINTED CIRCUIT BOARD

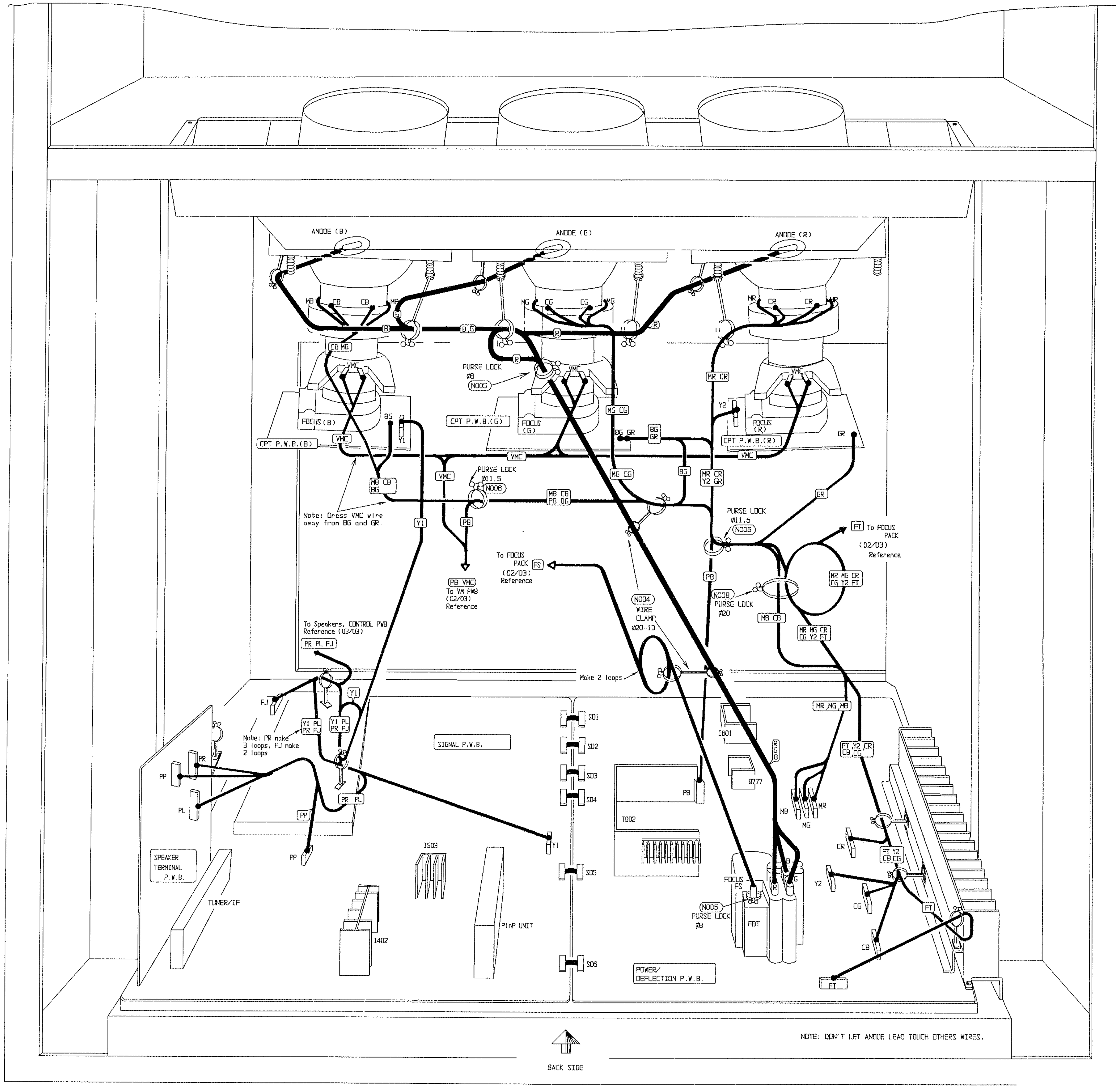
CONVERGENCE CORRECTION P.C.B.


PRC
PRR
IT01
IT02
IT03
IT04
IT05
IT06
QT01
QT02
QT03
QT04
QT05
QT06
QT07
QT08
QT09
QT10
QT11
QT12
QT13
QT14
RV-CENT
RH-L-SIZE
BH-CENT
BH-L-SIZE
GV-CENT
BV-CENT
GH-CENT
RH-R-LIN
H.SIZE
RH-L-LIN
V.SIZE
BH-R-LIN
BH-L-LIN
GV PIN PHASE
GH PIN PHASE
L/U PIN
PIN
L/U KEY
KEY
LIN
SIZE
BOW
SKEW
AP5X CONVERGENCE CORRECTION P.W.B.
HCS-40
JK01541
94V-0

WIRING DIAGRAM


CPT P. W. B.
B
G
R
DY
CY
VM
SCREEN
FOCUS
HEATER
+240V
WO.
8Ω
φ12/φ16
CONTROL P. W. B.
FOCUS PACK
SIGNAL P. W. B.
POWER/ DEFLECTION P. W. B.
SPEAKER TERMINAL P.W.B.
TERMINAL P. W. B.
PinP UNIT
TUNER
VM P. W. B.
FBT
ANALOG CONVERGENCE CORR. P. W. B. (AP52) ONLY
ANALOG 5P (AP52 only)
8P
AP52 ONLY
AC120V 60Hz
SU1
SD2
SD3
SD4
SD5
SD6
PP
SR
PR
SL
PL
CB
CC
CD
VM1
VM2
VMC
FJ
Y1
Y2
BG1
BG2
GR1
GR2
RR
RC
CB
CG
CR
MB
MG
MR
HIFI-R-L
HIFI-R-R

50EX14BV WIRING DRAWING (1/3)

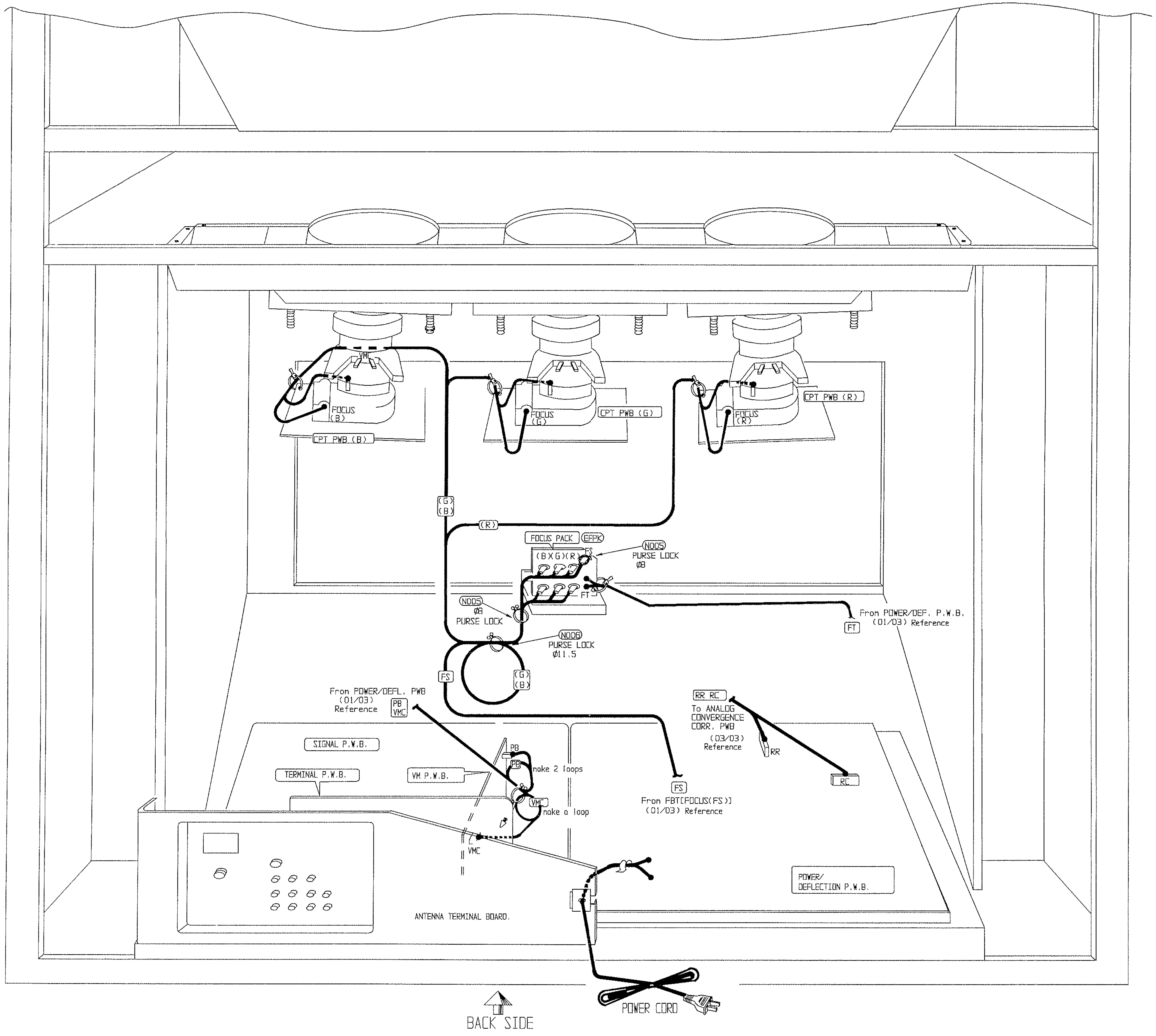

ANODE (B)
ANODE (G)
ANODE (R)
MB
CB
CB
MB
MG
CG
CG
MG
MR
CR
CR
MR
B
G
B,G
R
R
CB MB
R
PURSE LOCK
Ø8
N005
VMC
VMC
VMC
MR CR
Y2
FOCUS (B)
BG
Y1
CPT P.W.B.(G)
FOCUS (G)
MG CG
BG GR
BG GR
FOCUS (R)
CPT P.W.B.(R)
GR
CPT P.W.B.(B)
VMC
VMC
VMC
VMC
PURSE LOCK
Ø11.5
N006
MB CB BG
MG CG
BG
MR CR Y2 GR
MB CB PB BG
GR
Y1
PB
PURSE LOCK
Ø11.5
N006
FT
To FOCUS PACK (02/03) Reference
To FOCUS PACK
FS
(02/03) Reference
PB VMC
To VM PWB (02/03) Reference
PB
MR MG CR CG Y2 FT
N004
WIRE CLAMP
Ø20-13
N008
PURSE LOCK
Ø20
MB CB
MR MG CR CG Y2 FT
To Speakers, CONTROL PWB Reference (03/03)
PR PL FJ
Make 2 loops
Y1
FJ
Y1 PL PR FJ
Y1 PL PR FJ
SD1
SIGNAL P.W.B.
SD2
I601
R G B
MR,MG,MB
FT,Y2,CR CB,CG
PR
PP
SD3
Q777
PL
PR PL
SD4
PB
MB
MR
MG
PP
T902
CR
I503
Y1
FT Y2 CB CG
PP
SPEAKER TERMINAL P.W.B.
SD5
FOCUS FS
B
R
G
Y2
TUNER/IF
N005
PURSE LOCK
Ø8
FBT
CG
FT
PinP UNIT
I402
CB
SD6
POWER/ DEFLECTION P.W.B.
FT
BACK SIDE

Note: Dress VMC wire away from BG and GR.

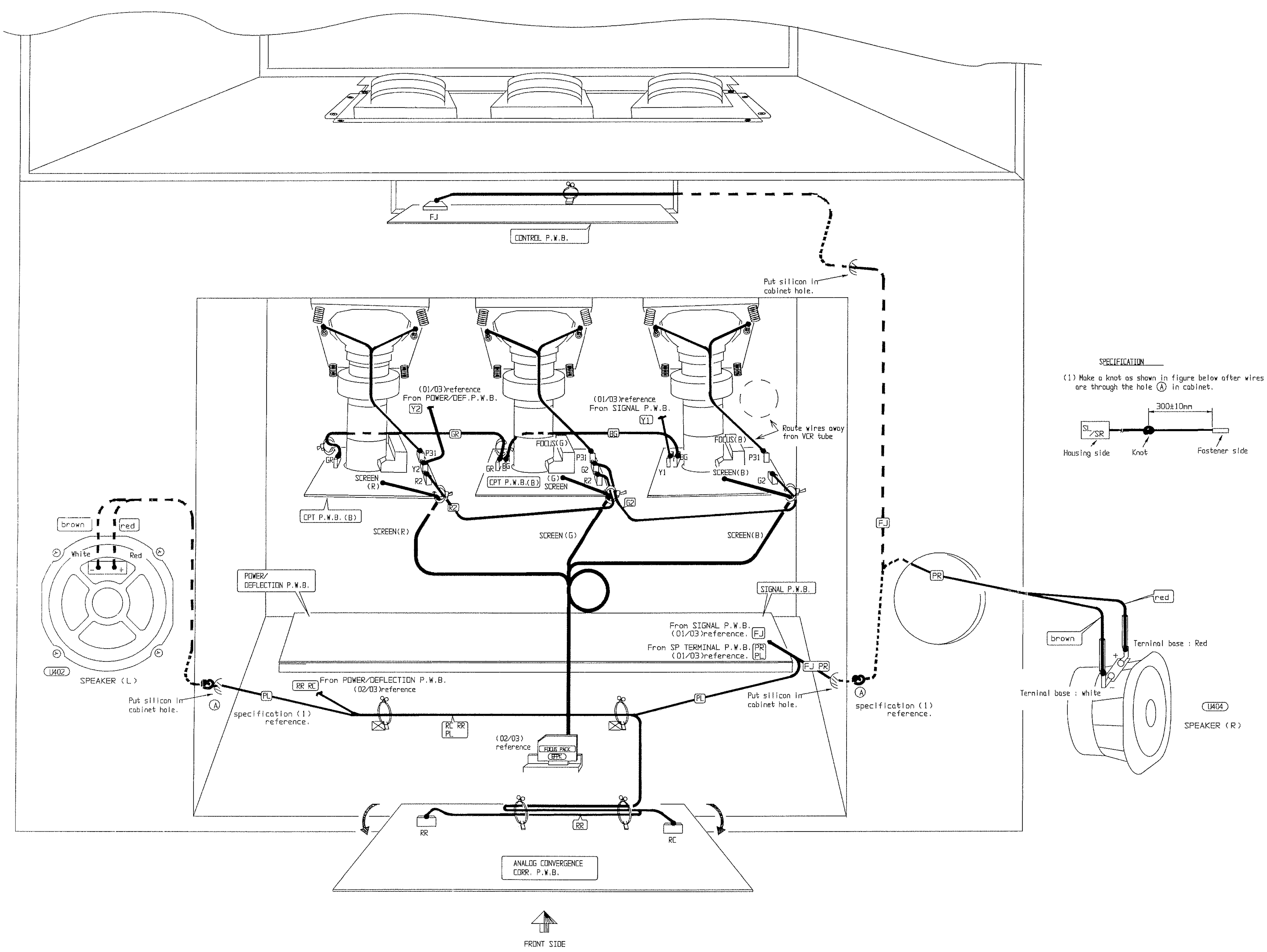
Note: PR make 3 loops, FJ make 2 loops

NOTE: DON'T LET ANODE LEAD TOUCH OTHERS WIRES.

50EX14BV WIRING DRAWING (2/3)


VMC
FOCUS (B)
CPT PWB (B)
FOCUS (G)
CPT PWB (G)
FOCUS (R)
CPT PWB (R)
(G) (B)
(R)
FOCUS PACK
EFPK
(B)(G)(R)
FS
N005
PURSE LOCK
Ø8
FT
N005
Ø8
PURSE LOCK
N006
PURSE LOCK
Ø11.5
From POWER/DEF. P.W.B. (01/03) Reference
FT
FS
(G) (B)
From POWER/DEFL. PWB (01/03) Reference
PB
VMC
RR RC
To ANALOG CONVERGENCE CORR. PWB (03/03) Reference
RR
RC
SIGNAL P.W.B.
TERMINAL P.W.B.
VM P.W.B.
PB
PB
make 2 loops
VMC
make a loop
VMC
FS
From FBT[FOCUS(FS)] (01/03) Reference
POWER/ DEFLECTION P.W.B.
ANTENNA TERMINAL BOARD.
POWER CORD
BACK SIDE

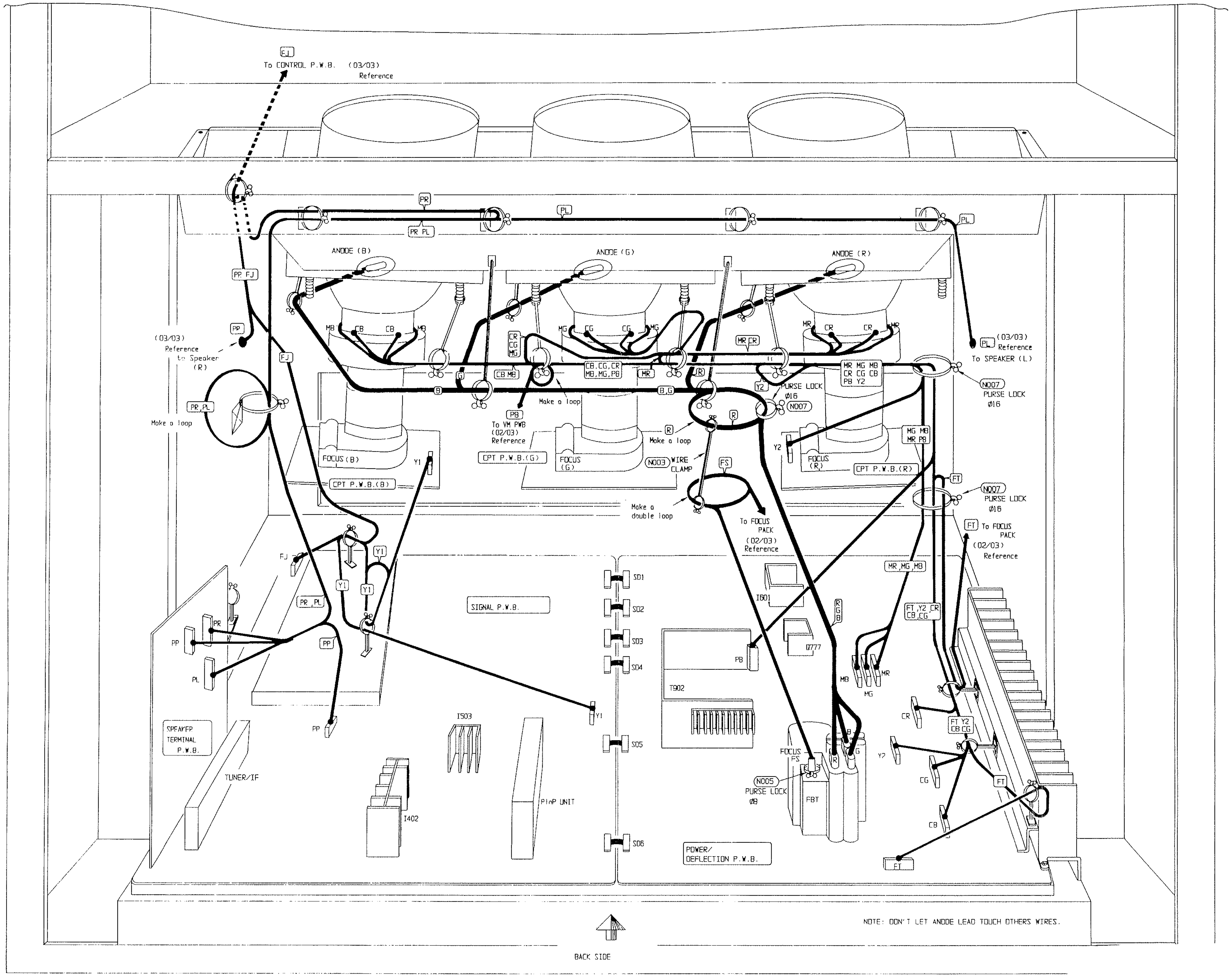
50EX14BV WIRING DRAWING (3/3)


FJ
CONTROL P.W.B.
Put silicon in cabinet hole.
(01/03)reference
From POWER/DEF.P.W.B.
Y2
(01/03)reference
From SIGNAL P.W.B.
Y1
Route wires away from VCR tube
GR
BG
FOCUS(G)
FOCUS(B)
P31
Y2
R2
SCREEN (R)
(G) SCREEN
G2
SCREEN(B)
CPT P.W.B.(B)
SCREEN(R)
SCREEN(G)
SCREEN(B)
FJ
brown
red
White
Red
UA02
SPEAKER (L)
Put silicon in cabinet hole.
A
POWER/ DEFLECTION P.W.B.
SIGNAL P.W.B.
From SIGNAL P.W.B. (01/03)reference. FJ
From SP TERMINAL P.W.B. PR PL (01/03)reference.
FJ PR
RR RC From POWER/DEFLECTION P.W.B. (02/03)reference
PL
specification (1) reference.
RC RR PL
(02/03) reference
FOCUS PACK
Put silicon in cabinet hole.
A
specification (1) reference.
PR
red
brown
Terminal base : Red
Terminal base : White
UA04
SPEAKER (R)
RR
RR
RC
ANALOG CONVERGENCE CORR. P.W.B.
FRONT SIDE
300±10mm
SL/SR
Housing side
Knot
Fastener side

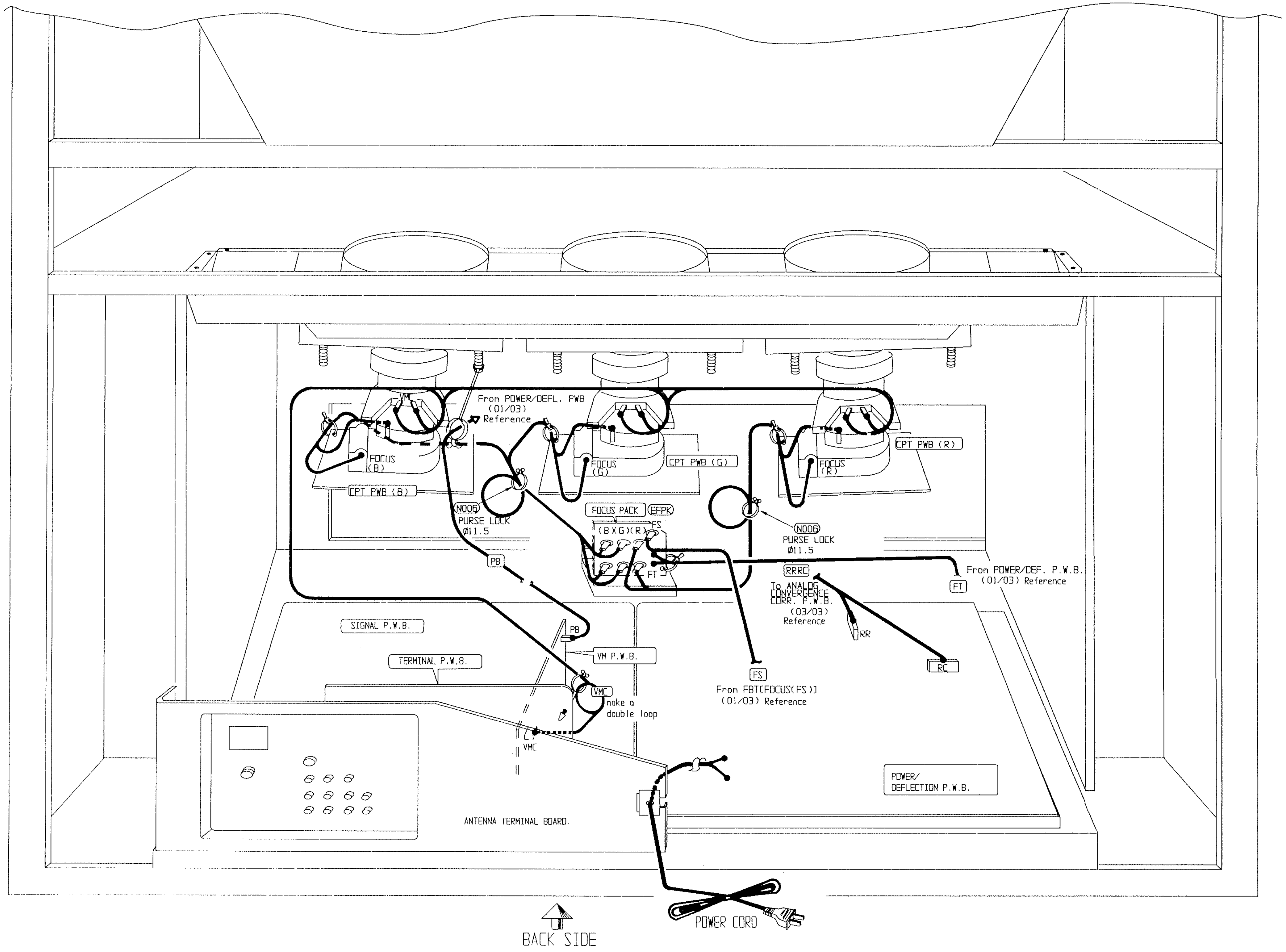
SPECIFICATION

(1) Make a knot as shown in figure below after wires are through the hole Ⓐ in cabinet.

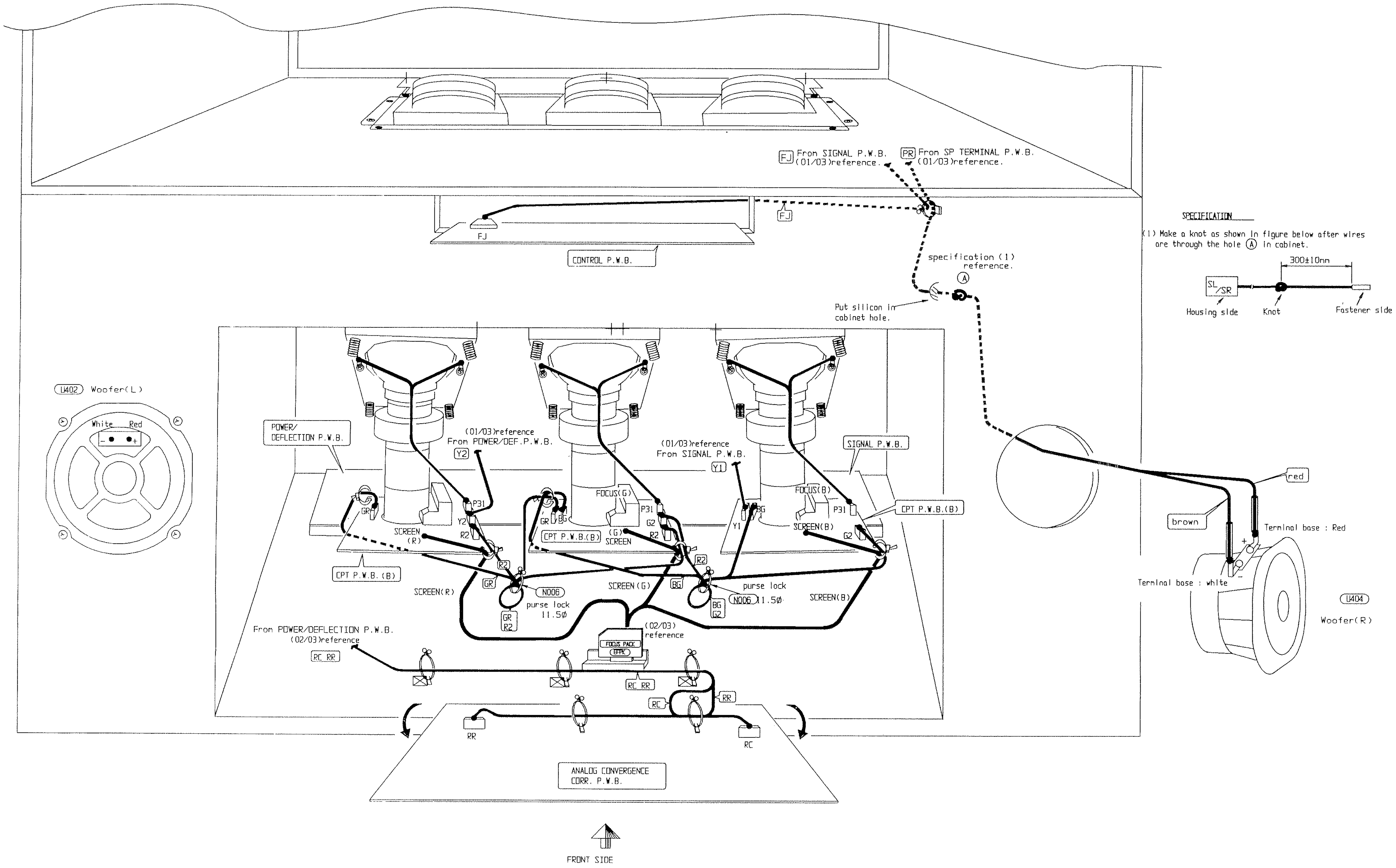
55EX15K WIRING DRAWING (1/3)


EJ
To CONTROL P.W.B. (03/03)
Reference
PR
PR PL
PL
PL
ANODE (B)
ANODE (G)
ANODE (R)
PP FJ
PP
(03/03)
Reference
to Speaker
(R)
FJ
PR,PL
Make a loop
MB
CB
CB
MB
MG
CG
CG
MG
MR
CR
CR
MR
CR
CG
MG
CB MB
G
B
CB,CG,CR
MB,MG,PB
MR
R
B,G
MR CR
Y2
PURSE LOCK
Ø16
N007
MR MG MB
CR CG CB
PB Y2
PL
(03/03)
Reference
To SPEAKER (L)
N007
PURSE LOCK
Ø16
PB
To VM PWB
(02/03)
Reference
Make a loop
R
Make a loop
R
FOCUS (B)
Y1
CPT P.W.B.(B)
CPT P.W.B.(G)
FOCUS
(G)
N003
WIRE
CLAMP
FS
Y2
FOCUS
(R)
CPT P.W.B.(R)
MG MB
MR PB
FT
N007
PURSE LOCK
Ø16
Make a
double loop
To FOCUS
PACK
(02/03)
Reference
FT
To FOCUS
PACK
(02/03)
Reference
FJ
Y1
Y1
Y1
PR,PL
PR
PP
PL
PP
SIGNAL P.W.B.
SD1
SD2
SD3
SD4
SD5
SD6
Y1
I601
RGB
MR,MG,MB
FT,Y2,CR
CB,CG
PB
Q777
T902
MB
MR
MG
CR
SPEAKER
TERMINAL
P.W.B.
TUNER/IF
I503
I402
PinP UNIT
FOCUS
FS
B
R
G
N005
PURSE LOCK
Ø8
FBT
Y2
FT Y2
CB CG
CG
CB
FT
FT
POWER/
DEFLECTION P.W.B.
NOTE: DON'T LET ANODE LEAD TOUCH OTHERS WIRES.
BACK SIDE

55EX15K WIRING DRAWING (2/3)


VM
From POWER/DEFL. PWB
(01/03)
Reference
FOCUS
(B)
CPT PWB (B)
FOCUS
(G)
CPT PWB (G)
FOCUS
(R)
CPT PWB (R)
N006
PURSE LOCK
Ø11.5
FOCUS PACK
EFPK
(B)(G)(R)
FS
FT
N006
PURSE LOCK
Ø11.5
PB
RRRC
To ANALOG CONVERGENCE CORR. P.W.B.
(03/03)
Reference
From POWER/DEF. P.W.B.
(01/03) Reference
FT
RR
RC
SIGNAL P.W.B.
PB
VM P.W.B.
TERMINAL P.W.B.
FS
From FBT[FOCUS(FS)]
(01/03) Reference
VMC
make a
double loop
VMC
ANTENNA TERMINAL BOARD.
POWER/
DEFLECTION P.W.B.
BACK SIDE
POWER CORD

55EX15K WIRING DRAWING (3/3)

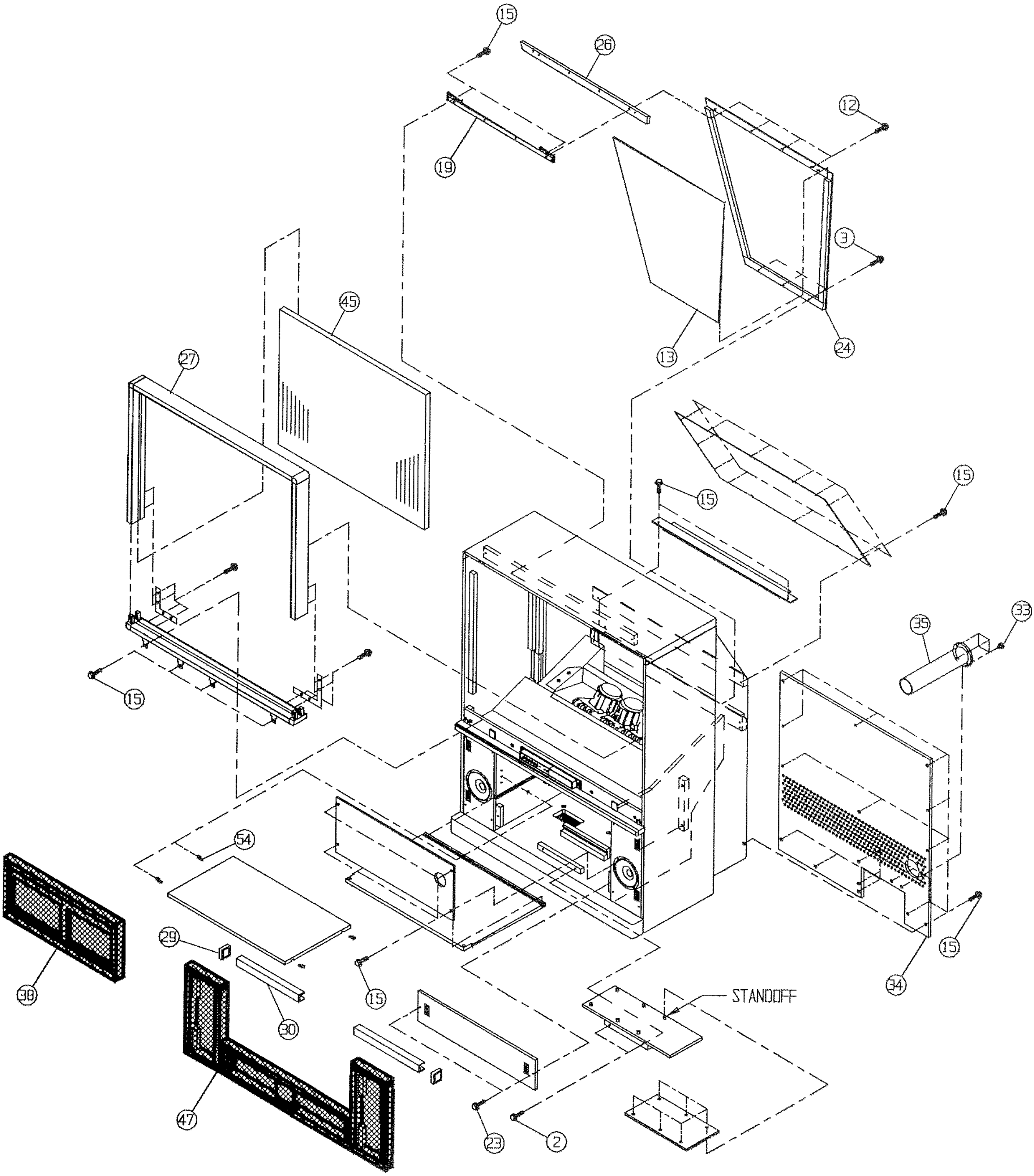


SPECIFICATION

(1) Make a knot as shown in figure below after wires are through the hole Ⓐ in cabinet.

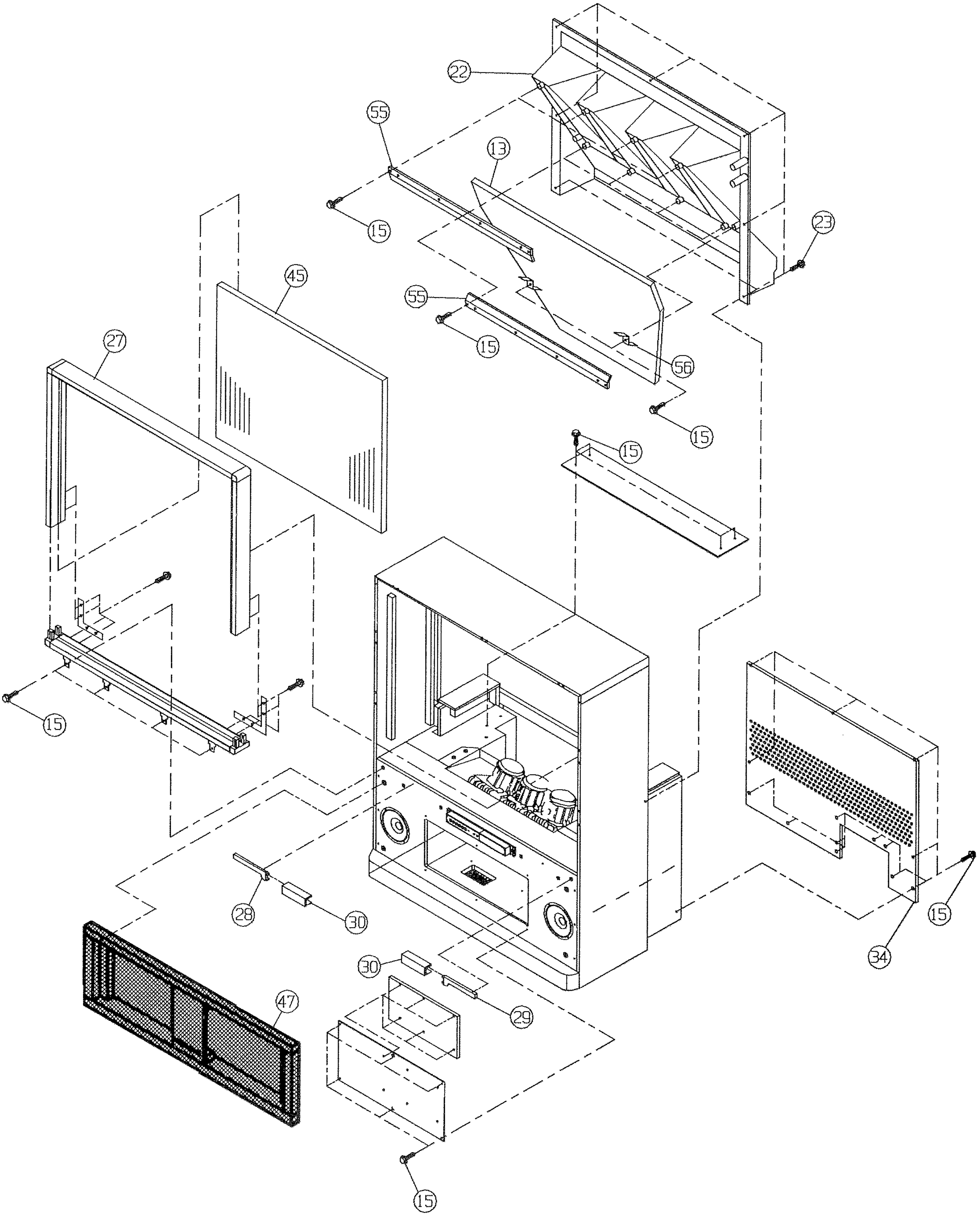
FJ From SIGNAL P.W.B. (01/03)reference.
PR From SP TERMINAL P.W.B. (01/03)reference.
FJ
FJ
CONTROL P.W.B.
specification (1) reference.
Ⓐ
Put silicon in cabinet hole.
300±10mm
SL/SR
Housing side
Knot
Fastener side
U402 Woofer(L)
White
Red
POWER/DEFLECTION P.W.B.
(01/03)reference From POWER/DEF.P.W.B.
Y2
P31
Y2
R2
GR
SCREEN (R)
CPT P.W.B.(B)
R2
GR
SCREEN(R)
N006
purse lock
11.5Ø
GR R2
(01/03)reference From SIGNAL P.W.B.
Y1
FOCUS(G)
P31
G2
GR
BG
CPT P.W.B.(B)
(G) SCREEN
R2
R2
SCREEN(G)
BG
SIGNAL P.W.B.
FOCUS(B)
BG
P31
Y1
SCREEN(B)
G2
CPT P.W.B.(B)
purse lock
N006 11.5Ø
BG G2
SCREEN(B)
(02/03) reference
FOCUS PACK
From POWER/DEFLECTION P.W.B. (02/03)reference
RC RR
RC RR
RC
RR
RR
RC
ANALOG CONVERGENCE CORR. P.W.B.
FRONT SIDE
red
brown
Terminal base : Red
Terminal base : white
U404
Woofer(R)

EXPLODED VIEW 50EX14BV (1/3)


15
26
12
19
3
45
13
24
27
15
15
15
33
35
15
54
38
29
15
30
34
15
STANDOFF
47
23
2

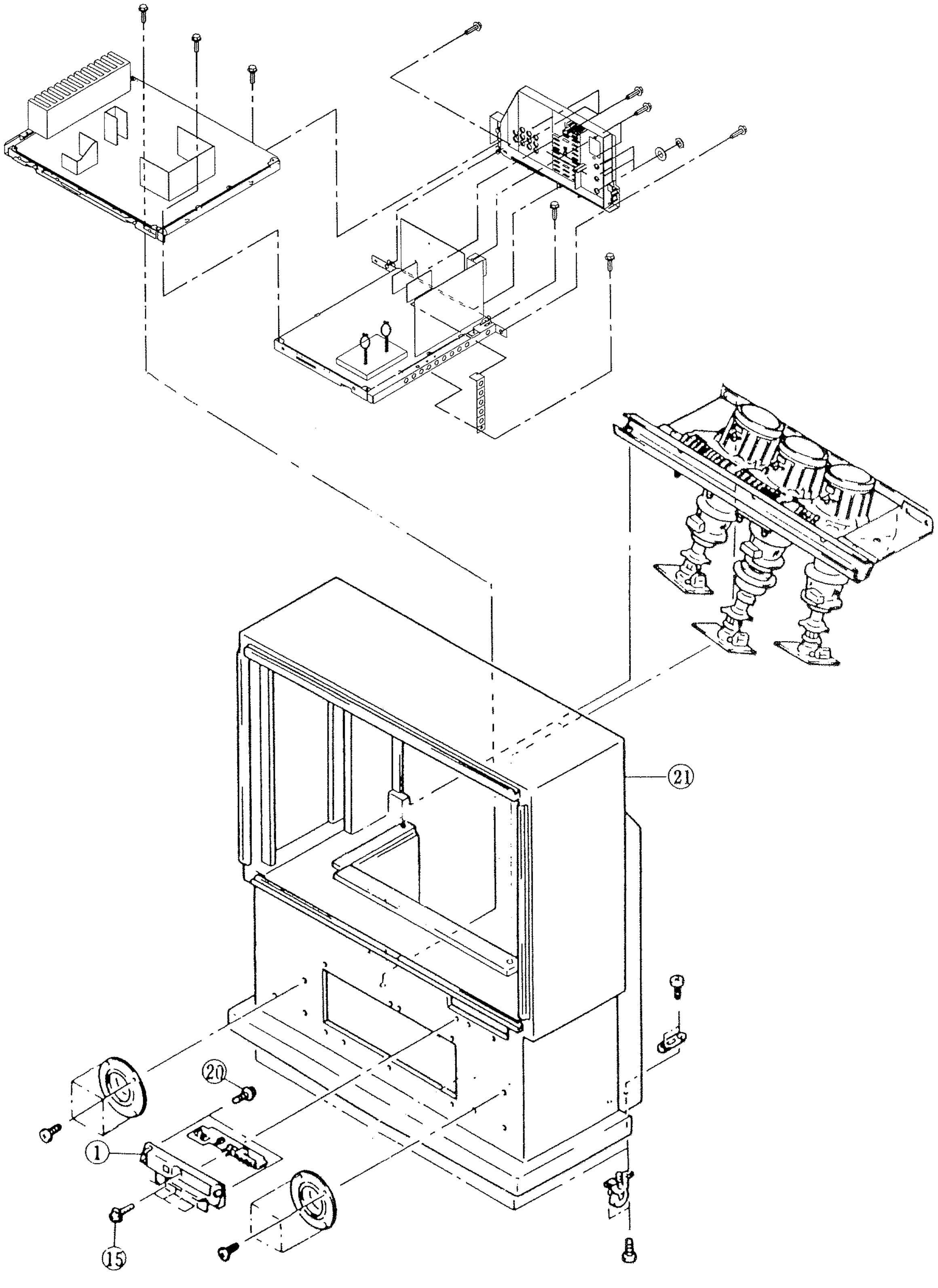
Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW 55EX15K (1/3)


22
55
13
15
45
55
15
56
27
23
15
15
15
15
28
30
30
29
47
34
15
15

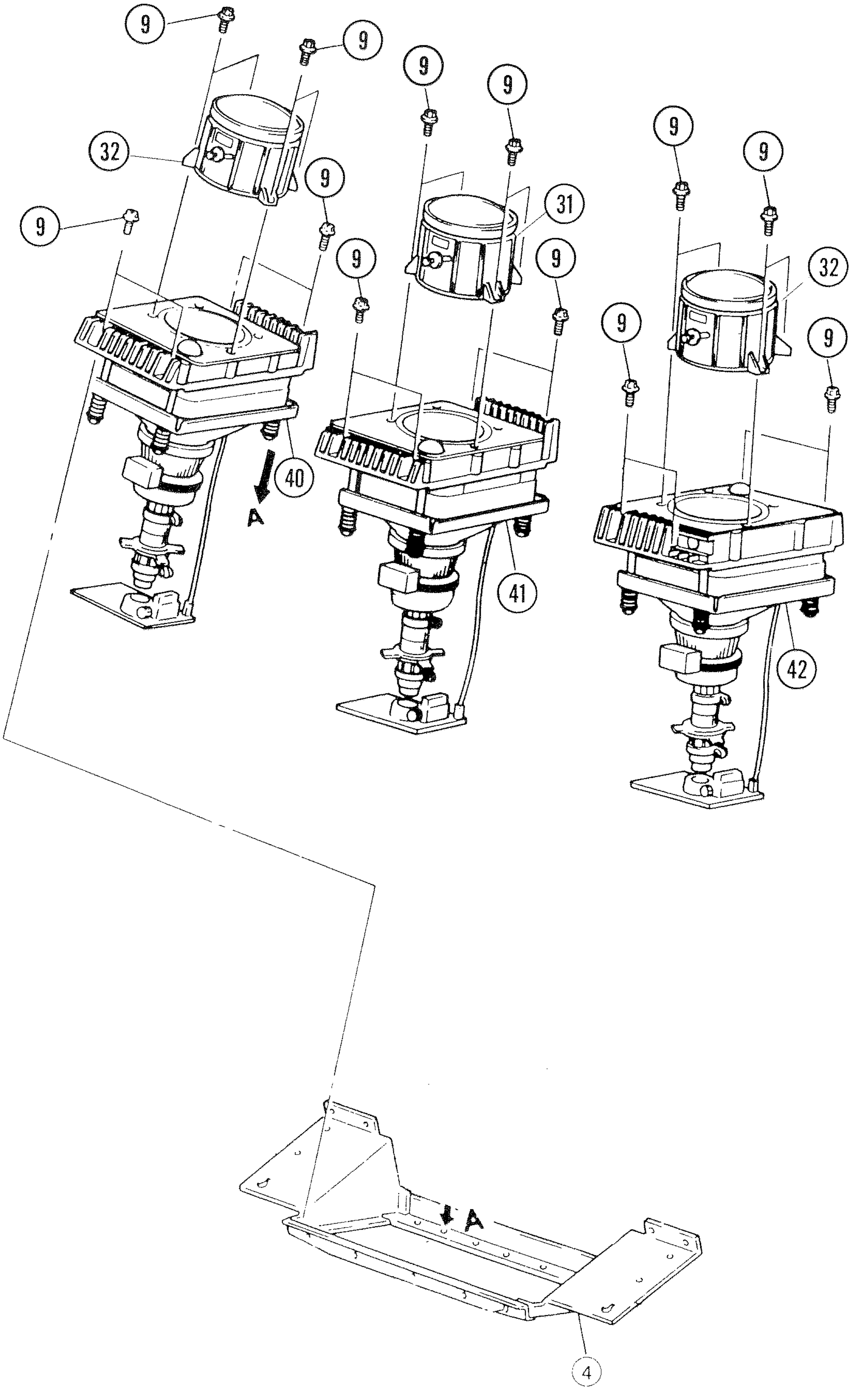
Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW (2/3)



Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW (3/3)



Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

REPLACEMENT PARTS LIST

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

ABBREVIATIONS

Capacitors:
- CD: Ceramic Disc
- PF: Polyester Film
- EL: Electrolytic
- PP: Polypropylene
- PR: Paper
- TA: Tantalum
- TM: Trimmer

Resistors:
- CF: Carbon Film
- CC: Carbon Composition
- MF: Metal Oxide Film
- VR: Variable Resistor
- WW: Wire Wound
- FR: Fuse Resistor
- MG: Metal Glaze

Semiconductors:
- TR: Transistor
- DI: Diode
- ZD: Zener Diode
- VA: Varistor
- TH: Thermistor
- IC: Integrated Circuit

CIRCUIT BLOCK	SECOND CHARACTER OF SYMBOL NO.	CIRCUIT BLOCK	SECOND CHARACTER OF SYMBOL NO.
Channel Management	0 or M	Horizontal	7 or H
Tuner	1 or T	CPT	8 or D
Signal	2 or S	Power	9 or P
Y-signal	3 or Y	Red	R
Audio	4 or A	Green	G
Color	5 or C	Blue	B
Vertical	6 or V	New & Others	EFJKLQUWXZ

SYMBOL NO.	PART NO.	PART DESCRIPTION
		CAPACITORS
CA01	0800003	EL 1MF 50V
CA02	0800003	EL 1MF 50V
CA05	0800003	EL 1MF 50V
CA06	0800003	EL 1MF 50V
CA07	0800003	EL 1MF 50V
CA08	0800003	EL 1MF 50V
CA26	0800015	EL 10MF 16V
CA27	0800015	EL 10MF 16V
CA28	0800015	EL 10MF 16V
CA29	0800015	EL 10MF 16V
CA34	0800015	EL 10MF 16V
CA37	0800015	EL 10MF 16V
CA38	0800041	EL 47MF 16V
CA40	0800015	EL 10MF 16V
CA41	0800015	EL 10MF 16V
CC02	0244171	CD 0.01MF +80-20% 50V
CC03	0890063	CD 15PF +-5% 50V
CC04	0244171	CD 0.01MF +80-20% 50V
CC05	0244171	CD 0.01MF +80-20% 50V
CC06	0800049	EL 100MF 16V
CF01	0800317	EL 47MF 16V
CF02	0800353R	EL 470MF 16V
CF03	0252396	EL 10MF 16V
CF04	0800291	EL 10MF 16V
CF05	0276721	PF 0.22MF 50V +-5%
CF06	0800291	EL 10MF 16V
CF07	0880041	PF 5600PF +-10% 50V
CF08	0244120	CD 820PF +-10% 50V
CF09	0284642R	EL 10MF 50V
CF10	0890083	CD 470PF +-10% 50V
CF11	0800291	EL 10MF 16V
CF12	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CF13	0890082R	CD 390PF +-10% 50V
CF14	0800353R	EL 470MF 16V
CF15	0252396	EL 10MF 16V
CF16	0800291	EL 10MF 16V
CF17	0244109	CD 4700PF +-10% 50V
CK06	0800326	EL 100MF 16V
CK07	0800326	EL 100MF 16V
CK15	0890087	CD 1000PF +-10% 50V
CK17	0890087	CD 1000PF +-10% 50V
CK19	0890087	CD 1000PF +-10% 50V
CK21	0890087	CD 1000PF +-10% 50V
CK23	0890087	CD 1000PF +-10% 50V
CK25	0890087	CD 1000PF +-10% 50V
CK27	0258175	EL 470MF 50V
CK28	0258175	EL 470MF 50V
CK29	0248688	CD 150PF +-5% 50V
CK30	0248688	CD 150PF +-5% 50V
CK31	0248688	CD 150PF +-5% 50V
CK32	0248688	CD 150PF +-5% 50V
CK33	0248688	CD 150PF +-5% 50V
CK34	0248688	CD 150PF +-5% 50V
CK35	0800317	EL 47MF 16V
CK36	0800317	EL 47MF 16V
CK37	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CK38	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CK39	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CK40	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CK44	0244118	CD 470PF +-10% 50V
CK46	0880044	PF 0.01MF +-10% 50V
CK47	0880044	PF 0.01MF +-10% 50V
CK51	0800321	EL 47MF 50V
CK52	0800321	EL 47MF 50V
CK53	0800321	EL 47MF 50V
CK54	0800321	EL 47MF 50V
CK55	0800321	EL 47MF 50V
CK56	0800321	EL 47MF 50V
CM01	0800023	EL 22MF 16V
CM02	0244171	CD 0.01MF +80-20% 50V
CM03	0800003	EL 1MF 50V
CM04	0244171	CD 0.01MF +80-20% 50V
CM05	0244171	CD 0.01MF +80-20% 50V
CN01	0800279R	EL 1MF 50V
CN02	0800288R	EL 4.7MF 50V
CN03	0880051	PF 0.033MF +-10% 50V
CN04	0890084	CD 560PF +-10% 50V
CN05	0800041	EL 47MF 16V
CN06	0800018	EL 10MF 50V
CT01	0244136	CD 270PF +-10% 50V
CT02	0800041	EL 47MF 16V
CT03	0244141	CD 0.01MF +-10% 50V
CT04	0244141	CD 0.01MF +-10% 50V
CT05	0800041	EL 47MF 16V
CT06	0244229	CD 150PF +-10% 50V
CT07	0244141	CD 0.01MF +-10% 50V
CT08	0800041	EL 47MF 16V
CT09	0880005	PF 2200PF +-10% 50V
CT10	0800003	EL 1MF 50V
CT11	0299001	PP 0.001MF +-2% 100V

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SYMBOL NO.	PART NO.	PART DESCRIPTION
CT12	0800001	EL 0.47MF 50V
CT13	0800003	EL 1MF 50V
CT14	0299029	PP 0.015MF +-2% 100V
CT15	0880011	PF 0.015MF +-10% 50V
CT16	0880011	PF 0.015MF +-10% 50V
CT17	0800015	EL 10MF 16V
CT18	0800015	EL 10MF 16V
CT19	0800003	EL 1MF 50V
CT20	0800003	EL 1MF 50V
CT21	0800003	EL 1MF 50V
CT22	0800003	EL 1MF 50V
CT23	0800003	EL 1MF 50V
CT24	0800015	EL 10MF 16V
CT25	0800015	EL 10MF 16V
CT26	0800049	EL 100MF 16V
CT27	0880001	PF 680PF +-10% 50V
CT28	0880001	PF 680PF +-10% 50V
CT29	0880016	PF 0.1MF +-10% 50V
CT31	0800015	EL 10MF 16V
CT32	0880014	PF 0.047MF +-10% 50V
CT33	0800015	EL 10MF 16V
CT34	0800015	EL 10MF 16V
CT35	0800015	EL 10MF 16V
CT36	0800049	EL 100MF 16V
CT37	0800003	EL 1MF 50V
CT38	0800003	EL 1MF 50V
CT39	0800003	EL 1MF 50V
CT40	0800003	EL 1MF 50V
CT41	0800015	EL 10MF 16V
CT42	0800015	EL 10MF 16V
CT43	0800015	EL 10MF 16V
CT44	0800003	EL 1MF 50V
CT45	0800015	EL 10MF 16V
CT46	0800015	EL 10MF 16V
CT47	0284638	EL 10MF 16V
CT48	0800003	EL 1MF 50V
CT49	0880012	PF 0.022MF +-10% 50V
CT51	0800003	EL 1MF 50V
CT52	0880014	PF 0.047MF +-10% 50V
CT60	0800003	EL 1MF 50V
CT61	0880013	PF 0.033MF +-10% 50V
CT66	0284623R	EL 1MF 50V
CT67	0284623R	EL 1MF 50V
CT68	0284623R	EL 1MF 50V
CT69	0284623R	EL 1MF 50V
CT70	0284623R	EL 1MF 50V
CT71	0284623R	EL 1MF 50V
CT72	0284436R	EL 100MF 35V
CW09	0800049	EL 100MF 16V
CW10	0800023	EL 22MF 16V
CW11	0276717	PF 0.1MF 50V +-5%
CW12	0800003	EL 1MF 50V
CW13	0800009	EL 4.7MF 25V
CW14	0800005	EL 2.2MF 50V
CW15	0276717	PF 0.1MF 50V +-5%
CW16	0880053	PF 0.047MF +-10% 50V
CW17	0800001	EL 0.47MF 50V
CW18	0276717	PF 0.1MF 50V +-5%
CW19	0800003	EL 1MF 50V
CW20	0800003	EL 1MF 50V
CW21	0800003	EL 1MF 50V
CW22	0292712F	TA 3.3MF 16V
CW23	0292714F	TA 10MF +-10% 16V
CW24	0800003	EL 1MF 50V
CW25	0800003	EL 1MF 50V
CY01	0800023	EL 22MF 16V
CY04	0800023	EL 22MF 16V
CY05	0800023	EL 22MF 16V
CY06	0800023	EL 22MF 16V
CY07	0800023	EL 22MF 16V
CY08	0800049	EL 100MF 16V
CY09	0276717	PF 0.1MF 50V +-5%
CY12	0800049	EL 100MF 16V
CY14	0800074	EL 470MF 16V
CY17	0800041	EL 47MF 16V
C001	0276717	PF 0.1MF 50V +-5%
C002	0800047	EL 100MF 6.3V
C003	0276717	PF 0.1MF 50V +-5%
C004	0890067	CD 33PF +-5% 50V
C005	0244171	CD 0.01MF +80-20% 50V
C006	0800015	EL 10MF 16V
C007	0890067	CD 33PF +-5% 50V
C010	0800009	EL 4.7MF 25V
C011	0800009	EL 4.7MF 25V
C012	0800009	EL 4.7MF 25V
C013	0800009	EL 4.7MF 25V
C014	0800009	EL 4.7MF 25V
C015	0880012	PF 0.022MF +-10% 50V
C016	0800009	EL 4.7MF 25V
C017	0800009	EL 4.7MF 25V
C018	0800047	EL 100MF 6.3V
C019	0276717	PF 0.1MF 50V +-5%
C020	0890085	CD 680PF +-10% 50V
C021	0800015	EL 10MF 16V
C022	0890071	CD 56PF +-5% 50V
C023	0890074	CD 100PF +-5% 50V
C024	0890087	CD 1000PF +-10% 50V
C025	0800047	EL 100MF 6.3V
C026	0276717	PF 0.1MF 50V +-5%
C027	0800023	EL 22MF 16V
C031	0800048	EL 100MF 10V
C032	0800015	EL 10MF 16V
C034	0800074	EL 470MF 16V
C035	0276717	PF 0.1MF 50V +-5%
C036	0800009	EL 4.7MF 25V
C037	0800049	EL 100MF 16V
C038	0276717	PF 0.1MF 50V +-5%
C039	0800075	EL 470MF 25V
C040	0243503	CD 150PF +-10% 500V
C041	0800003	EL 1MF 50V
C042	0800003	EL 1MF 50V
C045	0880018	PF 0.22MF +-10% 50V
C046	0800005	EL 2.2MF 50V
C301	0276717	PF 0.1MF 50V +-5%
C302	0800015	EL 10MF 16V
C303	0800007	EL 3.3MF 50V
C305	0800003	EL 1MF 50V
C306	0244171	CD 0.01MF +80-20% 50V
C307	0244171	CD 0.01MF +80-20% 50V
C308	0244171	CD 0.01MF +80-20% 50V
C309	0244171	CD 0.01MF +80-20% 50V
C310	0244171	CD 0.01MF +80-20% 50V
C311	0244171	CD 0.01MF +80-20% 50V
C313	0800015	EL 10MF 16V
C314	0800003	EL 1MF 50V
C315	0244171	CD 0.01MF +80-20% 50V
C317	0800003	EL 1MF 50V
C318	0800003	EL 1MF 50V
C319	0800005	EL 2.2MF 50V
C323	0880046	PF 0.015MF +-10% 50V
C324	0800003	EL 1MF 50V
C325	0880033	PF 1500PF +-10% 50V
C326	0800003	EL 1MF 50V
C327	0800049	EL 100MF 16V
C328	0244171	CD 0.01MF +80-20% 50V
C329	0800009	EL 4.7MF 25V
C330	0800049	EL 100MF 16V
C331	0800058	EL 220MF 16V
C332	0800015	EL 10MF 16V
C333	0880046	PF 0.015MF +-10% 50V
C334	0880051	PF 0.033MF +-10% 50V
C335	0880037	PF 3300PF +-10% 50V
C336	0276717	PF 0.1MF 50V +-5%
C337	0880037	PF 3300PF +-10% 50V
C338	0890079R	CD 270PF +-10% 50V
C339	0880037	PF 3300PF +-10% 50V

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SYMBOL NO.	PART NO.	PART DESCRIPTION
C340	0800003	EL 1MF 50V
C406	0890087	CD 1000PF +-10% 60V
C407	0800015	1EL 10MF 16V
C409	8900887	CD 1000PF +- 10% 50V
C411	0500015	EL 10MF 16V
C419	0880051	PF 0.033MF +-10% 50V
C420	0880041	PF 5600PF +-10% 50V
C421	0880051	PF 0.033MF +-10% 50V
C422	0880041	PF 5600PF +-10% 50V
C427	0800003	EL 1MF 50V
C428	0800003	EL 1MF 50V
C432	0800015	EL 10MF 16V
C433	0800003	EL 1MF 50V
C434	0800003	EL 1MF 50V
C435	0890087	CD 1000PF +-10% 50V
C436	0890087	CD 1000PF +-10% 50V
C437	0800042	EL 47MF 25V
C438	0800042	EL 47MF 25V
C439	0800051	EL 100MF 25V
C440	0800003	EL 1MF 50V
C441	0800003	EL 1MF 50V
C442	0800051	EL 100MF 25V
C443	0253934	EL 2200MF 35V
C444	0276717	PF 0.1MF 50V +-5%
C445	0276717	PF 0.1MF 50V +-5%
C446	0253934	EL 2200MF 35V
C447	0253934	EL 2200MF 35V
C448	0800041	EL 47MF 16V
C449	0276717	PF 0.1MF 50V +-5%
C450	0880018	PF 0.22MF +-10% 50V
C451	0800049	EL 100MF 16V
C452	0276717	PF 0.1MF 50V +-5%
C460	0800015	EL 10MF 16V
C461	0800015	EL 10MF 16V
C501	0800001	EL 0.47MF 50V
C502	0244171	CD 0.01MF +80-20% 50V
C503	0244171	CD 0.01MF +80-20% 50V
C504	0800058	EL 220MF 16V
C505	0890116	CD 15PF +-5% 50V
C507	0800003	EL 1MF 50V
C508	0800003	EL 1MF 50V
C509	0800003	EL 1MF 50V
C511	0244171	CD 0.01MF +80-20% 50V
C512	0244171	CD 0.01MF +80-20% 50V
C513	0244171	CD 0.01MF +80-20% 50V
C515	0244171	CD 0.01MF +80-20% 50V
C516	0244171	CD 0.01MF +80-20% 50V
C519	0800015	EL 10MF 16V
C521	0244171	CD 0.01MF +80-20% 50V
C525	0880044	PF 0.01MF +-10% 50V
C526	0276717	PF 0.1MF 50V +-5%
C527	0800075	EL 470MF 25V
C528	0276717	PF 0.1MF 50V +-5%
C532	0276717	PF 0.1MF 50V +-5%
C533	0800075	EL 470MF 25V
C534	0276717	PF 0.1MF 50V +-5%
C535	0800049	EL 100MF 16V
C536	0800075	EL 470MF 25V
C603	0800345	EL 330MF 25V
C604	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C606	0298261R	TA 1MF +-10% 35V
C607	0284446R	EL 1MF 50V
C608	0800368	EL 2200MF 25V
C609	0800347N	EL 330MF 50V
C610	0800326	EL 100MF 16V
C611	0800347N	EL 330MF 50V
C612	0880051	PF 0.033MF +-10% 50V
C613	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C614	0279859	PF 0.1MF +-10% 100V
C617	0284446R	EL 1MF 50V
C619	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C620	0800291	EL 10MF 16V
C622	0800041	EL 47MF 16V
C623	0800041	EL 47MF 16V
C701	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C702	0243507	CD 330PF +-10% 500V
C703	0244501	CD 1000PF +-10% 500V
C704	0259153	EL 220MF 160V
C705	0299926	PP 0.1MF +-10% 200V
C706	0890028	CD 330PF +-10% 50V
⚠ C708	0262414F	PP 3300PF +-5% 1800V (HHEA MD)
⚠ C709	0262426F	PP 9100PF +-5% 1.8KV
C710	0299931	PP 0.27MF +-10% 200V
C711	0299932	PP 0.33MF +-10% 200V
⚠ C715	0299720	PP 0.015MF +-5% 630V
C717	0259471	EL 6.8MF 50V
C718	0299636	PP 0.068MF +-5% 1600V
C720	0243503	CD 150PF +-10% 500V
C721	0253983F	EL 33MF
C722	0800329	EL 100MF 50V
C723	0880057	PF 0.1MF +-10% 50V
C724	0890087	CD 1000PF +-10% 50V
C725	0800279R	EL 1MF 50V
C726	0244109	CD 4700PF +-10% 50V
C727	0880048	PF 0.022MF +-10% 50V
C728	0890089	CD 1500PF +-10% 50V
C729	0800282	EL 2.2MF 50V
C730	0284634R	EL 4.7MF 50V
C731	0244501	CD 1000PF +-10% 500V
C732	0243508	CD 390PF +-10% 500V
C733	0243509	CD 470PF +-10% 500V
C735	0880031	PF 1000PF +-10% 50V
C738	0243503	CD 150PF +-10% 500V
C739	0890083	CD 470PF +-10% 50V
C740	0890084	CD 560PF +-10% 50V
⚠ C741	0246348	CD 220PF +-10% 2KV (HHEA MD)
C804	0244889	CD 2200PF +-10% 2KV
C805	0800326	EL 100MF 16V
C807	0244139	CD 1000PF +-10% 50V
C808	0244139	CD 1000PF +-10% 50V
C810	0800326	EL 100MF 16V
C831	0257543	EL 3.3MF 315V
C834	0244889	CD 2200PF +-10% 2KV
C835	0800326	EL 100MF 16V
C837	0244139	CD 1000PF +-10% 50V
C838	0244139	CD 1000PF +-10% 50V
C864	0244889	CD 2200PF +-10% 2KV
C865	0800326	EL 100MF 16V
C867	0244139	CD 1000PF +-10% 50V
C868	0890086	CD 820PF +-10% 50V
⚠ C901	AN00148S	PF 0.22MF +-20% 250V (HHEA MD)
⚠ C902	AN00144S	PF 0.1MF +-20% 250V (HHEA MD)
C903	0248593F	CD 4700PF +80-20% 250V
C904	0248593F	CD 4700PF +80-20% 250V
C905	0248593F	CD 4700PF +80-20% 250V
C906	0248593F	CD 4700PF +80-20% 250V
C907	0259167	EL 820MF 200V
C908	0259167	EL 820MF 200V
C911	0890087	CD 1000PF +-10% 50V
C912	0800059	EL 220MF 25V
C913	0299981	PP 0.01MF +-5% 630V
C914	0880044	PF 0.01MF +-10% 50V
C915	0880037	PF 3300PF +-10% 50V
C916	0880031	PF 1000PF +-10% 50V
C917	0800286R	EL 4.7MF 25V
C918	0880057	PF 0.1MF +-10% 50V
C920	0285221	EL 1000MF 35V
C921	0285221	EL 1000MF 35V
C922	0285221	EL 1000MF 35V
C924	0285224	EL 2200MF 25V
C925	0285224	EL 2200MF 25V
C926	0258697	EL 470MF 160V
C927	0880044	PF 0.01MF +-10% 50V
C928	0244105	CD 2200PF +-10% 50V
C930	0284436R	EL 100MF 35V
C931	0284436R	EL 100MF 35V
C933	0800326	EL 100MF 16V

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SYMBOL NO.	PART NO.	PART DESCRIPTION
C935	0284436R	EL 100MF 35V
C936	0284405R	EL 220MF 16V
C937	0284405R	EL 220MF 16V
C939	0284436R	EL 100MF 35V
C942	0800326	EL 100MF 16V
C943	0800279R	EL 1MF 50V
C944	0800317	EL 47MF 16V
C945	0284647R	EL 22MF 16V
C947	0258121R	EL 2.2MF 100V
C954	0800363	EL 1000MF 35V
C955	0800317	EL 47MF 16V
C956	0800082	EL 1000MF 16V
C957	0800331R	EL 100MF 63V
C958	0800331R	EL 100MF 63V
C960	0880057	PF 0.1MF +-10% 50V
C967	0880062	PF 0.22MF +-10% 50V
C968	0880062	PF 0.22MF +-10% 50V
C969	0880062	PF 0.22MF +-10% 50V
C972	0800291	EL 10MF 16V
C973	0800083	EL 1000MF 25V
		RESISTORS
RA01	0700051	CF 5.6K OHM +-5% 1/16W
RA02	0700051	CF 5.6K OHM +-5% 1/16W
RA05	0700051	CF 5.6K OHM +-5% 1/16W
RA06	0700051	CF 5.6K OHM +-5% 1/16W
RA07	0700051	CF 5.6K OHM +-5% 1/16W
RA08	0700051	CF 5.6K OHM +-5% 1/16W
RA11	0700027	CF 100 OHM +-5% 1/16W
RA12	0700027	CF 100 OHM +-5% 1/16W
RA18	0700062	CF 39K OHM +-5% 1/16W
RA19	0700054	CF 10K OHM +-5% 1/16W
RA20	0700041	CF 1K OHM +-5% 1/16W
RA21	0700041	CF 1K OHM +-5% 1/16W
RA22	0700034	CF 330 OHM +-5% 1/16W
RA23	0700032	CF 220 OHM +-5% 1/16W
RA24	0700062	CF 39K OHM +-5% 1/16W
RA25	0700054	CF 10K OHM +-5% 1/16W
RA26	0700041	CF 1K OHM +-5% 1/16W
RA27	0700041	CF 1K OHM +-5% 1/16W
RA28	0700034	CF 330 OHM +-5% 1/16W
RA29	0700032	CF 220 OHM +-5% 1/16W
RA30	0700041	CF 1K OHM +-5% 1/16W
RA31	0700067	CF 100K OHM +-5% 1/16W
RA32	0700041	CF 1K OHM +-5% 1/16W
RA33	0700067	CF 100K OHM +-5% 1/16W
RA50	0700041	CF 1K OHM +-5% 1/16W
RA51	0700067	CF 100K OHM +-5% 1/16W
RA52	0700041	CF 1K OHM +-5% 1/16W
RA53	0700067	CF 100K OHM +-5% 1/16W
RA58	0700041	CF 1K OHM +-5% 1/16W
RA59	0700067	CF 100K OHM +-5% 1/16W
RA60	0700041	CF 1K OHM +-5% 1/16W
RA61	0700067	CF 100K OHM +-5% 1/16W
RA64	0100123	CF 270K OHM +-5% 1/8W
RA65	0100123	CF 270K OHM +-5% 1/8W
RA66	0100123	CF 270K OHM +-5% 1/8W
RA67	0100123	CF 270K OHM +-5% 1/8W
RC02	0700027	CF 100 OHM +-5% 1/16W
RC03	0700027	CF 100 OHM +-5% 1/16W
RC04	0700027	CF 100 OHM +-5% 1/16W
RC05	0700027	CF 100 OHM +-5% 1/16W
RC06	0700037	CF 560 OHM +-5% 1/16W
RC07	0700032	CF 220 OHM +-5% 1/16W
RC08	0700032	CF 220 OHM +-5% 1/16W
RC09	0700056	CF 15K OHM +-5% 1/16W
RC10	0700055	CF 12K OHM +-5% 1/16W
RC11	0700027	CF 100 OHM +-5% 1/16W
RC12	0700027	CF 100 OHM +-5% 1/16W
RC13	0700053	CF 8.2K OHM +-5% 1/16W
RC14	0700057	CF 18K OHM +-5% 1/16W
RC15	0700041	CF 1K OHM +-5% 1/16W

SYMBOL NO.	PART NO.	PART DESCRIPTION
RC16	0100038	CF 75 OHM +-5% 1/8W
RC18	0700027	CF 100 OHM +-5% 1/16W
RC19	0700039	CF 820 OHM +-5% 1/16W
RF01	0110279	MF 27K OHM +-5% 2W
RF02	0110279	MF 27K OHM +-5% 2W
RF03	0110279	MF 27K OHM +-5% 2W
RF04	0110279	MF 27K OHM +-5% 2W
RF05	0110279	MF 27K OHM +-5% 2W
RF06	0114213	CF 33K OHM +-5% 1/4W
RF07	0100065	CF 1K OHM +-5% 1/8W
RF08	0100041	CF 100 OHM +-5% 1/8W
RF09	0700035	CF 390 OHM +-5% 1/16W
RF10	0700045	CF 2.2K OHM +-5% 1/16W
RF11	0700059	CF 27K OHM +-5% 1/16W
RF12	0700059	CF 27K OHM +-5% 1/16W
RF13	0700053	CF 8.2K OHM +-5% 1/16W
RF14	0700047	CF 3.3K OHM +-5% 1/16W
RF15	0700046	CF 2.7K OHM +-5% 1/16W
RF16	0700049	CF 4.7K OHM +-5% 1/16W
RF17	0700027	CF 100 OHM +-5% 1/16W
RF18	0700054	CF 10K OHM +-5% 1/16W
RF19	0700037	CF 560 OHM +-5% 1/16W
RF20	0700066	CF 82K OHM +-5% 1/16W
RF21	0700049	CF 4.7K OHM +-5% 1/16W
RF22	0700059	CF 27K OHM +-5% 1/16W
RF23	0700043	CF 1.5K OHM +-5% 1/16W
RF24	0700051	CF 5.6K OHM +-5% 1/16W
RF25	0700038	CF 680 OHM +-5% 1/16W
RF26	0187098	CF 24K OHM +-5% 1/16W
RF27	0700054	CF 10K OHM +-5% 1/16W
RF28	0100113	CF 100K OHM +-5% 1/8W
RF29	0700063	CF 47K OHM +-5% 1/16W
RF30	0700046	CF 2.7K OHM +-5% 1/16W
RF31	0700041	CF 1K OHM +-5% 1/16W
RF32	0700052	CF 6.8K OHM +-5% 1/16W
RF33	0700058	CF 22K OHM +-5% 1/16W
RF34	0700058	CF 22K OHM +-5% 1/16W
RF35	0700056	CF 15K OHM +-5% 1/16W
RF36	0700053	CF 8.2K OHM +-5% 1/16W
RF37	0700041	CF 1K OHM +-5% 1/16W
RF38	0700061	CF 33K OHM +-5% 1/16W
RF39	0700049	CF 4.7K OHM +-5% 1/16W
RF40	0700054	CF 10K OHM +-5% 1/16W
RF41	0700054	CF 10K OHM +-5% 1/16W
RKA8	0700041	CF 1K OHM +-5% 1/16W
RK01	0700063	CF 47K OHM +-5% 1/16W
RK02	0700049	CF 4.7K OHM +-5% 1/16W
RK03	0100125	CF 330K OHM +-5% 1/8W
RK13	0700063	CF 47K OHM +-5% 1/16W
RK14	0110229	MF 220 OHM +-5% 2W
RK15	0113696	CF 6.8 OHM +-5% 1/2W
RK16	0113696	CF 6.8 OHM +-5% 1/2W
RK17	0100077	CF 3.3K OHM +-5% 1/8W
RK18	0700063	CF 47K OHM +-5% 1/16W
RK19	0110225	MF 150 OHM +-5% 2W
RK20	0113692	CF 4.7 OHM +-5% 1/2W
RK21	0113692	CF 4.7 OHM +-5% 1/2W
RK22	0100077	CF 3.3K OHM +-5% 1/8W
RK23	0700063	CF 47K OHM +-5% 1/16W
RK24	0110229	MF 220 OHM +-5% 2W
RK25	0113696	CF 6.8 OHM +-5% 1/2W
RK26	0113696	CF 6.8 OHM +-5% 1/2W
RK27	0100077	CF 3.3K OHM +-5% 1/8W
RK28	0700063	CF 47K OHM +-5% 1/16W
RK29	0110225	MF 150 OHM +-5% 2W
RK30	0113698	CF 8.2 OHM +-5% 1/2W
RK31	0113698	CF 8.2 OHM +-5% 1/2W
RK32	0100077	CF 3.3K OHM +-5% 1/8W
RK33	0700063	CF 47K OHM +-5% 1/16W
RK34	0110229	MF 220 OHM +-5% 2W
RK35	0113696	CF 6.8 OHM +-5% 1/2W
RK36	0113696	CF 6.8 OHM +-5% 1/2W
RK37	0100077	CF 3.3K OHM +-5% 1/8W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RK38	0100077	CF 3.3K OHM +-5% 1/8W
RK39	0700063	CF 47K OHM +-5% 1/16W
RK40	0110225	MF 150 OHM +-5% 2W
RK41	0113692	CF 4.7 OHM +-5% 1/2W
RK42	0113692	CF 4.7 OHM +-5% 1/2W
RK43	0700032	CF 220 OHM +-5% 1/16W
RK44	0700032	CF 220 OHM +-5% 1/16W
RK45	0700032	CF 220 OHM +-5% 1/16W
RK46	0700032	CF 220 OHM +-5% 1/16W
RK47	0700032	CF 220 OHM +-5% 1/16W
RK48	0700032	CF 220 OHM +-5% 1/16W
RK49	0700032	CF 220 OHM +-5% 1/16W
RK50	0700032	CF 220 OHM +-5% 1/16W
RK51	0700032	CF 220 OHM +-5% 1/16W
RK52	0700032	CF 220 OHM +-5% 1/16W
RK53	0700044	CF 1.8K OHM +-5% 1/16W
RK54	0700041	CF 1K OHM +-5% 1/16W
RK55	0700041	CF 1K OHM +-5% 1/16W
RK56	0700041	CF 1K OHM +-5% 1/16W
RK59	0700051	CF 5.6K OHM +-5% 1/16W
RK60	0700048	CF 3.9K OHM +-5% 1/16W
RK61	0700051	CF 5.6K OHM +-5% 1/16W
RK62	0700049	CF 4.7K OHM +-5% 1/16W
RK63	0700051	CF 5.6K OHM +-5% 1/16W
RK64	0700049	CF 4.7K OHM +-5% 1/16W
RK65	0700051	CF 5.6K OHM +-5% 1/16W
RK66	0700051	CF 5.6K OHM +-5% 1/16W
RK67	0700057	CF 18K OHM +-5% 1/16W
RK68	0700046	CF 2.7K OHM +-5% 1/16W
RK69	0700062	CF 39K OHM +-5% 1/16W
RK70	0700057	CF 18K OHM +-5% 1/16W
RK71	0700046	CF 2.7K OHM +-5% 1/16W
RK72	0700062	CF 39K OHM +-5% 1/16W
RK73	0700057	CF 18K OHM +-5% 1/16W
RK74	0700049	CF 4.7K OHM +-5% 1/16W
RK75	0700062	CF 39K OHM +-5% 1/16W
RK76	0700057	CF 18K OHM +-5% 1/16W
RK77	0700049	CF 4.7K OHM +-5% 1/16W
RK78	0700062	CF 39K OHM +-5% 1/16W
RM01	0700041	CF 1K OHM +-5% 1/16W
RM02	0700058	CF 22K OHM +-5% 1/16W
RM03	0700045	CF 2.2K OHM +-5% 1/16W
RM04	0100065	CF 1K OHM +-5% 1/8W
RM05	0100065	CF 1K OHM +-5% 1/8W
RM06	0700041	CF 1K OHM +-5% 1/16W
RM07	0700043	CF 1.5K OHM +-5% 1/16W
RM08	0700046	CF 2.7K OHM +-5% 1/16W
RM09	0700049	CF 4.7K OHM +-5% 1/16W
RM10	0100129	CF 470K OHM +-5% 1/8W
RM11	0700041	CF 1K OHM +-5% 1/16W
RM12	0100125	CF 330K OHM +-5% 1/8W
RM13	0114149	CF 560 OHM +-5% 1/4W
RM14	0100125	CF 330K OHM +-5% 1/8W
RM15	0700054	CF 10K OHM +-5% 1/16W
RN01	0700057	CF 18K OHM +-5% 1/16W
RN02	0700041	CF 1K OHM +-5% 1/16W
RN03	0700041	CF 1K OHM +-5% 1/16W
RN04	0700067	CF 100K OHM +-5% 1/16W
RN05	0700052	CF 6.8K OHM +-5% 1/16W
RN06	0700051	CF 5.6K OHM +-5% 1/16W
RN07	0700054	CF 10K OHM +-5% 1/16W
RN08	0700057	CF 18K OHM +-5% 1/16W
RN09	0700061	CF 33K OHM +-5% 1/16W
RN10	0700054	CF 10K OHM +-5% 1/16W
RN11	0700058	CF 22K OHM +-5% 1/16W
RN12	0700051	CF 5.6K OHM +-5% 1/16W
RN13	0700044	CF 1.8K OHM +-5% 1/16W
RN14	0700054	CF 10K OHM +-5% 1/16W
RN15	0700058	CF 22K OHM +-5% 1/16W
RN16	0700064	CF 56K OHM +-5% 1/16W
RN18	0700057	CF 18K OHM +-5% 1/16W
RN19	0700049	CF 4.7K OHM +-5% 1/16W
RSA1	0147152	WW 27 OHM +-5% 3W
RTA2	0700064	CF 56K OHM +-5% 1/16W
RTA3	0700057	CF 18K OHM +-5% 1/16W
RTA7	0700067	CF 100K OHM +-5% 1/16W
RTA8	0700058	CF 22K OHM +-5% 1/16W
RTA9	0700061	CF 33K OHM +-5% 1/16W
RTE1	0700067	CF 100K OHM +-5% 1/16W
RTE2	0700058	CF 22K OHM +-5% 1/16W
RTE3	0700061	CF 33K OHM +-5% 1/16W
RTE4	0700063	CF 47K OHM +-5% 1/16W
RTE5	0700063	CF 47K OHM +-5% 1/16W
RTE6	0700067	CF 100K OHM +-5% 1/16W
RTE7	0700062	CF 39K OHM +-5% 1/16W
RTE8	0700063	CF 47K OHM +-5% 1/16W
RTE9	0700063	CF 47K OHM +-5% 1/16W
RTF1	0700067	CF 100K OHM +-5% 1/16W
RTF2	0700062	CF 39K OHM +-5% 1/16W
RTF3	0700041	CF 1K OHM +-5% 1/16W
RTF4	0700041	CF 1K OHM +-5% 1/16W
RTF5	0700049	CF 4.7K OHM +-5% 1/16W
RTF6	0700041	CF 1K OHM +-5% 1/16W
RTF7	0700041	CF 1K OHM +-5% 1/16W
RTF8	0700049	CF 4.7K OHM +-5% 1/16W
RTF9	0700041	CF 1K OHM +-5% 1/16W
RTG1	0700041	CF 1K OHM +-5% 1/16W
RTG2	0700049	CF 4.7K OHM +-5% 1/16W
RTG3	0700041	CF 1K OHM +-5% 1/16W
RTG4	0700041	CF 1K OHM +-5% 1/16W
RTG5	0700049	CF 4.7K OHM +-5% 1/16W
RTG6	0700041	CF 1K OHM +-5% 1/16W
RTG7	0700041	CF 1K OHM +-5% 1/16W
RTG8	0700054	CF 10K OHM +-5% 1/16W
RTG9	0700041	CF 1K OHM +-5% 1/16W
RTH1	0700041	CF 1K OHM +-5% 1/16W
RTH2	0700052	CF 6.8K OHM +-5% 1/16W
RTH3	0700041	CF 1K OHM +-5% 1/16W
RTH4	0700041	CF 1K OHM +-5% 1/16W
RTH5	0700066	CF 82K OHM +-5% 1/16W
RTH6	0700041	CF 1K OHM +-5% 1/16W
RTH7	0700041	CF 1K OHM +-5% 1/16W
RTH8	0700066	CF 82K OHM +-5% 1/16W
RTH9	0700032	CF 220 OHM +-5% 1/16W
RTJ1	0700032	CF 220 OHM +-5% 1/16W
RTJ2	0700032	CF 220 OHM +-5% 1/16W
RTJ3	0700056	CF 15K OHM +-5% 1/16W
RTJ4	0700032	CF 220 OHM +-5% 1/16W
RTJ5	0700032	CF 220 OHM +-5% 1/16W
RTJ6	0700056	CF 15K OHM +-5% 1/16W
RTJ7	0700032	CF 220 OHM +-5% 1/16W
RTJ8	0700044	CF 1.8K OHM +-5% 1/16W
RTJ9	0700049	CF 4.7K OHM +-5% 1/16W
RTK1	0700048	CF 3.9K OHM +-5% 1/16W
RT01	0700027	CF 100 OHM +-5% 1/16W
RT02	0700051	CF 5.6K OHM +-5% 1/16W
RT03	0700027	CF 100 OHM +-5% 1/16W
RT04	0700054	CF 10K OHM +-5% 1/16W
RT05	0119514	FR 10 OHM +-5% 1/4W
RT06	0119514	FR 10 OHM +-5% 1/4W
RT07	0700049	CF 4.7K OHM +-5% 1/16W
RT08	0700046	CF 2.7K OHM +-5% 1/16W
RT09	0187092	CF 13K OHM+-5% 1/16W
RT10	0700054	CF 10K OHM +-5% 1/16W
RT11	0700045	CF 2.2K OHM +-5% 1/16W
RT12	0700065	CF 68K OHM +-5% 1/16W
RT13	0700054	CF 10K OHM +-5% 1/16W
RT14	0187080	CF 4.3K OHM +-5% 1/16W
RT15	0187072	CF 2K OHM +-5% 1/16W
RT16	0100087	CF 8.2K OHM +-5% 1/8W
RT17	0100121	CF 220K OHM +-5% 1/8W
RT18	0114161	CF 1K OHM +-5% 1/4W
RT19	0700049	CF 4.7K OHM +-5% 1/16W
RT20	0700061	CF 33K OHM +-5% 1/16W
RT21	0100075	CF 2.7K OHM +-5% 1/8W
RT22	0700038	CF 680 OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RT23	0700056	CF 15K OHM +-5% 1/16W
RT24	0114177	CF 4.7K OHM +-5% 1/4W
RT25	0700047	CF 3.3K OHM +-5% 1/16W
RT26	0150134	VR 1K OHM-B
RT27	0700065	CF 68K OHM +-5% 1/16W
RT28	0700054	CF 10K OHM +-5% 1/16W
RT29	0100121	CF 220K OHM +-5% 1/8W
RT30	0187068	CF 1.3K OHM +-5% 1/16W
RT31	0700047	CF 3.3K OHM +-5% 1/16W
RT32	0700047	CF 3.3K OHM +-5% 1/16W
RT33	0700062	CF 39K OHM +-5% 1/16W
RT34	0700049	CF 4.7K OHM +-5% 1/16W
RT35	0700055	CF 12K OHM +-5% 1/16W
RT36	0700054	CF 10K OHM +-5% 1/16W
RT37	0700055	CF 12K OHM +-5% 1/16W
RT38	0700053	CF 8.2K OHM +-5% 1/16W
RT39	0700057	CF 18K OHM +-5% 1/16W
RT40	0700054	CF 10K OHM +-5% 1/16W
RT41	0700058	CF 22K OHM +-5% 1/16W
RT42	0700063	CF 47K OHM +-5% 1/16W
RT44	0700047	CF 3.3K OHM +-5% 1/16W
RT45	0700052	CF 6.8K OHM +-5% 1/16W
RT46	0700054	CF 10K OHM +-5% 1/16W
RT50	0700066	CF 82K OHM +-5% 1/16W
RT51	0700066	CF 82K OHM +-5% 1/16W
RT52	0187104	CF 43K OHM +-5% 1/16W
RT53	0700045	CF 2.2K OHM +-5% 1/16W
RT57	0700067	CF 100K OHM +-5% 1/16W
RT58	0100121	CF 220K OHM +-5% 1/8W
RT59	0100124	CF 300K OHM +-5% 1/8W
RT60	0700055	CF 12K OHM +-5% 1/16W
RT61	0700053	CF 8.2K OHM +-5% 1/16W
RT62	0187098	CF 24K OHM +-5% 1/16W
RT63	0100117	CF 150K OHM +-5% 1/8W
RT64	0700054	CF 10K OHM +-5% 1/16W
RT65	0700052	CF 6.8K OHM +-5% 1/16W
RT66	0700067	CF 100K OHM +-5% 1/16W
RT67	0114161	CF 1K OHM +-5% 1/4W
RT68	0700051	CF 5.6K OHM +-5% 1/16W
RT69	0700055	CF 12K OHM +-5% 1/16W
RT70	2340552	THERMISTOR
RT71	0700042	CF 1.2K OHM +-5% 1/16W
RT72	0700051	CF 5.6K OHM +-5% 1/16W
RT73	0700044	CF 1.8K OHM +-5% 1/16W
RT74	0700044	CF 1.8K OHM +-5% 1/16W
RT75	0700052	CF 6.8K OHM +-5% 1/16W
RT76	0700054	CF 10K OHM +-5% 1/16W
RT77	0700067	CF 100K OHM +-5% 1/16W
RT78	0100081	CF 4.7K OHM +-5% 1/8W
RT79	0700052	CF 6.8K OHM +-5% 1/16W
RT80	0700054	CF 10K OHM +-5% 1/16W
RT81	0700067	CF 100K OHM +-5% 1/16W
RT82	0700042	CF 1.2K OHM +-5% 1/16W
RT83	0700047	CF 3.3K OHM +-5% 1/16W
RT84	0700062	CF 39K OHM +-5% 1/16W
RT85	0700054	CF 10K OHM +-5% 1/16W
RT86	0700047	CF 3.3K OHM +-5% 1/16W
RT87	0700051	CF 5.6K OHM +-5% 1/16W
RT88	0700051	CF 5.6K OHM +-5% 1/16W
RT97	0700047	CF 3.3K OHM +-5% 1/16W
RT98	0700061	CF 33K OHM +-5% 1/16W
RUA1	0700045	CF 2.2K OHM +-5% 1/16W
RUA2	0700048	CF 3.9K OHM +-5% 1/16W
RUA3	0150136	VR 5K OHM-B
RUA4	0700055	CF 12K OHM +-5% 1/16W
RUA5	0700027	CF 100 OHM +-5% 1/16W
RUA6	0150136	VR 5K OHM-B
RUA7	0700047	CF 3.3K OHM +-5% 1/16W
RUA8	0700046	CF 2.7K OHM +-5% 1/16W
RUA9	0700046	CF 2.7K OHM +-5% 1/16W
RUE1	0150136	VR 5K OHM-B
RUE2	0700066	CF 82K OHM +-5% 1/16W
RUE3	0150136	VR 5K OHM-B
RUE4	0700045	CF 2.2K OHM +-5% 1/16W
RUE5	0700052	CF 6.8K OHM +-5% 1/16W
RUE6	0700054	CF 10K OHM +-5% 1/16W
RUE7	0150136	VR 5K OHM-B
RUE8	0700041	CF 1K OHM +-5% 1/16W
RUE9	0700049	CF 4.7K OHM +-5% 1/16W
RUF1	0700049	CF 4.7K OHM +-5% 1/16W
RUF2	0150136	VR 5K OHM-B
RUF3	0700042	CF 1.2K OHM +-5% 1/16W
RUF4	0700045	CF 2.2K OHM +-5% 1/16W
RUF5	0700054	CF 10K OHM +-5% 1/16W
RUF6	0150136	VR 5K OHM-B
RUF7	0700049	CF 4.7K OHM +-5% 1/16W
RUF8	0700043	CF 1.5K OHM +-5% 1/16W
RUF9	0700046	CF 2.7K OHM +-5% 1/16W
RUG1	0150136	VR 5K OHM-B
RUG2	0700052	CF 6.8K OHM +-5% 1/16W
RUG3	0700048	CF 3.9K OHM +-5% 1/16W
RUG4	0700048	CF 3.9K OHM +-5% 1/16W
RUG5	0150136	VR 5K OHM-B
RUG6	0700049	CF 4.7K OHM +-5% 1/16W
RUG7	0700049	CF 4.7K OHM +-5% 1/16W
RUG8	0700047	CF 3.3K OHM +-5% 1/16W
RUG9	0150136	VR 5K OHM-B
RUH1	0700041	CF 1K OHM +-5% 1/16W
RUH2	0700052	CF 6.8K OHM +-5% 1/16W
RUH3	0700041	CF 1K OHM +-5% 1/16W
RUH4	0150136	VR 5K OHM-B
RUH5	0700054	CF 10K OHM +-5% 1/16W
RUH6	0700046	CF 2.7K OHM +-5% 1/16W
RUH7	0700041	CF 1K OHM +-5% 1/16W
RUH8	0150136	VR 5K OHM-B
RUH9	0700051	CF 5.6K OHM +-5% 1/16W
RUJ1	0700049	CF 4.7K OHM +-5% 1/16W
RUJ2	0700046	CF 2.7K OHM +-5% 1/16W
RUJ3	0150136	VR 5K OHM-B
RUJ4	0700054	CF 10K OHM +-5% 1/16W
RUJ5	0700042	CF 1.2K OHM +-5% 1/16W
RUJ6	0700052	CF 6.8K OHM +-5% 1/16W
RUJ7	0150136	VR 5K OHM-B
RUJ8	0700066	CF 82K OHM +-5% 1/16W
RUJ9	0700051	CF 5.6K OHM +-5% 1/16W
RUK1	0700053	CF 8.2K OHM +-5% 1/16W
RUK2	0150136	VR 5K OHM-B
RUK3	0700048	CF 3.9K OHM +-5% 1/16W
RUK4	0700049	CF 4.7K OHM +-5% 1/16W
RUK5	0700053	CF 8.2K OHM +-5% 1/16W
RUK6	0150136	VR 5K OHM-B
RUK7	0700067	CF 100K OHM +-5% 1/16W
RUK8	0700048	CF 3.9K OHM +-5% 1/16W
RUK9	0700054	CF 10K OHM +-5% 1/16W
RUL1	0150136	VR 5K OHM-B
RUL2	0700054	CF 10K OHM +-5% 1/16W
RUL3	0700043	CF 1.5K OHM +-5% 1/16W
RUL4	0700047	CF 3.3K OHM +-5% 1/16W
RUL5	0150136	VR 5K OHM-B
RUL6	0700054	CF 10K OHM +-5% 1/16W
RUL7	0700047	CF 3.3K OHM +-5% 1/16W
RUL8	0700047	CF 3.3K OHM +-5% 1/16W
RUL9	0150137	VR 10K OHM-B
RUN1	0700047	CF 3.3K OHM +-5% 1/16W
RUN2	0700047	CF 3.3K OHM +-5% 1/16W
RUN3	0150633	VR 30K OHM
RUN4	0700064	CF 56K OHM +-5% 1/16W
RUN5	0150138	VR 20K OHM-B
RUN6	0700062	CF 39K OHM +-5% 1/16W
RUN7	0700064	CF 56K OHM +-5% 1/16W
RUN8	0700063	CF 47K OHM +-5% 1/16W
RUN9	0150138	VR 20K OHM-B
RUP1	0700058	CF 22K OHM +-5% 1/16W
RUP2	0700063	CF 47K OHM +-5% 1/16W
RUP3	0700064	CF 56K OHM +-5% 1/16W
RUP4	0150138	VR 20K OHM-B

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
RUP5	0700062	CF 39K OHM +-5% 1/16W	RU60	0700045	CF 2.2K OHM +-5% 1/16W
RUP6	0700064	CF 56K OHM +-5% 1/16W	RU61	0150136	VR 5K OHM-B
RUP7	0700063	CF 47K OHM +-5% 1/16W	RU62	0700043	CF 1.5K OHM +-5% 1/16W
RUP8	0150138	VR 20K OHM-B	RU63	0700056	CF 15K OHM +-5% 1/16W
RUP9	0700058	CF 22K OHM +-5% 1/16W	RU64	0700041	CF 1K OHM +-5% 1/16W
RUQ1	0700063	CF 47K OHM +-5% 1/16W	RU65	0150136	VR 5K OHM-B
RUQ2	0700064	CF 56K OHM +-5% 1/16W	RU66	0700054	CF 10K OHM +-5% 1/16W
RUQ3	0150138	VR 20K OHM-B	RU67	0700044	CF 1.8K OHM +-5% 1/16W
RUQ4	0700062	CF 39K OHM +-5% 1/16W	RU68	0700041	CF 1K OHM +-5% 1/16W
RUQ5	0700064	CF 56K OHM +-5% 1/16W	RU69	0150136	VR 5K OHM-B
RUQ6	0700063	CF 47K OHM +-5% 1/16W	RU70	0700054	CF 10K OHM +-5% 1/16W
RUQ7	0150138	VR 20K OHM-B	RU71	0700041	CF 1K OHM +-5% 1/16W
RUQ8	0700058	CF 22K OHM +-5% 1/16W	RU72	0700045	CF 2.2K OHM +-5% 1/16W
RUQ9	0700063	CF 47K OHM +-5% 1/16W	RU73	0150136	VR 5K OHM-B
RU01	0150136	VR 5K OHM-B	RU74	0700061	CF 33K OHM +-5% 1/16W
RU02	0700042	CF 1.2K OHM +-5% 1/16W	RU75	0700041	CF 1K OHM +-5% 1/16W
RU03	0700049	CF 4.7K OHM +-5% 1/16W	RU76	0150136	VR 5K OHM-B
RU04	0700051	CF 5.6K OHM +-5% 1/16W	RU77	0700047	CF 3.3K OHM +-5% 1/16W
RU05	0150136	VR 5K OHM-B	RU78	0700046	CF 2.7K OHM +-5% 1/16W
RU06	0700042	CF 1.2K OHM +-5% 1/16W	RU79	0700046	CF 2.7K OHM +-5% 1/16W
RU07	0700046	CF 2.7K OHM +-5% 1/16W	RU80	0150136	VR 5K OHM-B
RU08	0700052	CF 6.8K OHM +-5% 1/16W	RU81	0700066	CF 82K OHM +-5% 1/16W
RU09	0150136	VR 5K OHM-B	RU82	0150136	VR 5K OHM-B
RU10	0700048	CF 3.9K OHM +-5% 1/16W	RU83	0700048	CF 3.9K OHM +-5% 1/16W
RU11	0700043	CF 1.5K OHM +-5% 1/16W	RU84	0700053	CF 8.2K OHM +-5% 1/16W
RU12	0700045	CF 2.2K OHM +-5% 1/16W	RU85	0700054	CF 10K OHM +-5% 1/16W
RU13	0150136	VR 5K OHM-B	RU86	0150136	VR 5K OHM-B
RU14	0700047	CF 3.3K OHM +-5% 1/16W	RU87	0700048	CF 3.9K OHM +-5% 1/16W
RU15	0700054	CF 10K OHM +-5% 1/16W	RU88	0700051	CF 5.6K OHM +-5% 1/16W
RU16	0700047	CF 3.3K OHM +-5% 1/16W	RU89	0700048	CF 3.9K OHM +-5% 1/16W
RU17	0150136	VR 5K OHM-B	RU90	0150136	VR 5K OHM-B
RU18	0700054	CF 10K OHM +-5% 1/16W	RU91	0700042	CF 1.2K OHM +-5% 1/16W
RU19	0150136	VR 5K OHM-B	RU92	0700041	CF 1K OHM +-5% 1/16W
RU20	0700047	CF 3.3K OHM +-5% 1/16W	RU93	0700054	CF 10K OHM +-5% 1/16W
RU21	0700048	CF 3.9K OHM +-5% 1/16W	RU94	0150136	VR 5K OHM-B
RU22	0700049	CF 4.7K OHM +-5% 1/16W	RU95	0700054	CF 10K OHM +-5% 1/16W
RU23	0150136	VR 5K OHM-B	RU96	0700043	CF 1.5K OHM +-5% 1/16W
RU24	0700058	CF 22K OHM +-5% 1/16W	RU97	0700048	CF 3.9K OHM +-5% 1/16W
RU25	0150136	VR 5K OHM-B	RU98	0150136	VR 5K OHM-B
RU26	0700046	CF 2.7K OHM +-5% 1/16W	RU99	0700052	CF 6.8K OHM +-5% 1/16W
RU27	0700053	CF 8.2K OHM +-5% 1/16W	RW13	0700041	CF 1K OHM +-5% 1/16W
RU28	0700054	CF 10K OHM +-5% 1/16W	RW14	0700065	CF 68K OHM +-5% 1/16W
RU29	0150136	VR 5K OHM-B	RW15	0187076	CF 3K OHM +-5% 1/16W
RU30	0700042	CF 1.2K OHM +-5% 1/16W	RW16	0187082	CF 5.1K OHM +-5% 1/16W
RU31	0700049	CF 4.7K OHM +-5% 1/16W	RW17	0700056	CF 15K OHM +-5% 1/16W
RU32	0700052	CF 6.8K OHM +-5% 1/16W	RW70	0187070M	CF 1.6K OHM +-5% 1/16W
RU33	0150136	VR 5K OHM-B	RW85	0700041	CF 1K OHM +-5% 1/16W
RU34	0700042	CF 1.2K OHM +-5% 1/16W	RW86	0700041	CF 1K OHM +-5% 1/16W
RU35	0700042	CF 1.2K OHM +-5% 1/16W	RY01	0700027	CF 100 OHM +-5% 1/16W
RU36	0700052	CF 6.8K OHM +-5% 1/16W	RY05	0700027	CF 100 OHM +-5% 1/16W
RU37	0150136	VR 5K OHM-B	RY06	0700027	CF 100 OHM +-5% 1/16W
RU38	0700045	CF 2.2K OHM +-5% 1/16W	RY07	0700027	CF 100 OHM +-5% 1/16W
RU39	0700048	CF 3.9K OHM +-5% 1/16W	RY08	0700041	CF 1K OHM +-5% 1/16W
RU40	0700047	CF 3.3K OHM +-5% 1/16W	RY09	0700041	CF 1K OHM +-5% 1/16W
RU41	0150136	VR 5K OHM-B	RY10	0700041	CF 1K OHM +-5% 1/16W
RU42	0700051	CF 5.6K OHM +-5% 1/16W	RY11	0700041	CF 1K OHM +-5% 1/16W
RU43	0700041	CF 1K OHM +-5% 1/16W	RY12	0700027	CF 100 OHM +-5% 1/16W
RU44	0700052	CF 6.8K OHM +-5% 1/16W	RY13	0700027	CF 100 OHM +-5% 1/16W
RU45	0150136	VR 5K OHM-B	RY14	0700027	CF 100 OHM +-5% 1/16W
RU46	0700053	CF 8.2K OHM +-5% 1/16W	RY15	0700027	CF 100 OHM +-5% 1/16W
RU47	0150136	VR 5K OHM-B	RY17	0700041	CF 1K OHM +-5% 1/16W
RU48	0700047	CF 3.3K OHM +-5% 1/16W	RY19	0700041	CF 1K OHM +-5% 1/16W
RU49	0700047	CF 3.3K OHM +-5% 1/16W	RY31	0100038	CF 75 OHM +-5% 1/8W
RU50	0700049	CF 4.7K OHM +-5% 1/16W	RY32	0100038	CF 75 OHM +-5% 1/8W
RU51	0150136	VR 5K OHM-B	RY33	0700063	CF 47K OHM +-5% 1/16W
RU52	0700056	CF 15K OHM +-5% 1/16W	RY34	0700058	CF 22K OHM +-5% 1/16W
RU53	0150136	VR 5K OHM-B	RY35	0100038	CF 75 OHM +-5% 1/8W
RU54	0700046	CF 2.7K OHM +-5% 1/16W	RY39	0700034	CF 330 OHM +-5% 1/16W
RU55	0700052	CF 6.8K OHM +-5% 1/16W	RY40	0114141	CF 270 OHM +-5% 1/4W
RU56	0700054	CF 10K OHM +-5% 1/16W	RY41	0100037	CF 68 OHM +-5% 1/8W
RU57	0150136	VR 5K OHM-B	RY42	0100113	CF 100K OHM +-5% 1/8W
RU58	0700048	CF 3.9K OHM +-5% 1/16W	RY43	0700041	CF 1K OHM +-5% 1/16W
RU59	0700053	CF 8.2K OHM +-5% 1/16W	RY44	0700054	CF 10K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
RY45	0700039	CF 820 OHM +-5% 1/16W	R097	0700063	CF 47K OHM +-5% 1/16W
RY47	0700054	CF 10K OHM +-5% 1/16W	R099	0700063	CF 47K OHM +-5% 1/16W
R004	0100065	CF 1K OHM +-5% 1/8W	R100	0700067	CF 100K OHM +-5% 1/16W
R005	0100089	CF 10K OHM +-5% 1/8W	R101	0700058	CF 22K OHM +-5% 1/16W
R006	0100065	CF 1K OHM +-5% 1/8W	R102	0700058	CF 22K OHM +-5% 1/16W
R007	0100065	CF 1K OHM +-5% 1/8W	R103	0700041	CF 1K OHM +-5% 1/16W
R008	0700041	CF 1K OHM +-5% 1/16W	R104	0700041	CF 1K OHM +-5% 1/16W
R009	0700041	CF 1K OHM +-5% 1/16W	R105	0700041	CF 1K OHM +-5% 1/16W
R010	0700054	CF 10K OHM +-5% 1/16W	R106	0700058	CF 22K OHM +-5% 1/16W
R011	0700041	CF 1K OHM +-5% 1/16W	R107	0700041	CF 1K OHM +-5% 1/16W
R012	0700041	CF 1K OHM +-5% 1/16W	R108	0700051	CF 5.6K OHM +-5% 1/16W
R013	0700058	CF 22K OHM +-5% 1/16W	R109	0700041	CF 1K OHM +-5% 1/16W
R014	0700058	CF 22K OHM +-5% 1/16W	R110	0700041	CF 1K OHM +-5% 1/16W
R015	0700058	CF 22K OHM +-5% 1/16W	R113	0700056	CF 15K OHM +-5% 1/16W
R016	0700041	CF 1K OHM +-5% 1/16W	R116	0700054	CF 10K OHM +-5% 1/16W
R017	0700041	CF 1K OHM +-5% 1/16W	R117	0700054	CF 10K OHM +-5% 1/16W
R018	0700041	CF 1K OHM +-5% 1/16W	R119	0700041	CF 1K OHM +-5% 1/16W
R019	0700032	CF 220 OHM +-5% 1/16W	R130	0700058	CF 22K OHM +-5% 1/16W
R020	0700041	CF 1K OHM +-5% 1/16W	R131	0700055	CF 12K OHM +-5% 1/16W
R021	0700041	CF 1K OHM +-5% 1/16W	R132	0700063	CF 47K OHM +-5% 1/16W
R022	0700058	CF 22K OHM +-5% 1/16W	R133	0700054	CF 10K OHM +-5% 1/16W
R023	0700049	CF 4.7K OHM +-5% 1/16W	R134	0700058	CF 22K OHM +-5% 1/16W
R025	0700041	CF 1K OHM +-5% 1/16W	R135	0700041	CF 1K OHM +-5% 1/16W
R026	0700041	CF 1K OHM +-5% 1/16W	R136	0700041	CF 1K OHM +-5% 1/16W
R028	0700041	CF 1K OHM +-5% 1/16W	R137	0700041	CF 1K OHM +-5% 1/16W
R029	0700041	CF 1K OHM +-5% 1/16W	R138	0700041	CF 1K OHM +-5% 1/16W
R032	0700041	CF 1K OHM +-5% 1/16W	R139	0700041	CF 1K OHM +-5% 1/16W
R033	0700054	CF 10K OHM +-5% 1/16W	R140	0700041	CF 1K OHM +-5% 1/16W
R035	0700058	CF 22K OHM +-5% 1/16W	R141	0700041	CF 1K OHM +-5% 1/16W
R037	0700041	CF 1K OHM +-5% 1/16W	R142	0700041	CF 1K OHM +-5% 1/16W
R038	0700041	CF 1K OHM +-5% 1/16W	R143	0700041	CF 1K OHM +-5% 1/16W
R040	0700027	CF 100 OHM +-5% 1/16W	R144	0700041	CF 1K OHM +-5% 1/16W
R042	0700054	CF 10K OHM +-5% 1/16W	R145	0700027	CF 100 OHM +-5% 1/16W
R043	0700054	CF 10K OHM +-5% 1/16W	R146	0700054	CF 10K OHM +-5% 1/16W
R044	0700049	CF 4.7K OHM +-5% 1/16W	R147	0700041	CF 1K OHM +-5% 1/16W
R048	0700058	CF 22K OHM +-5% 1/16W	R148	0700041	CF 1K OHM +-5% 1/16W
R049	0700058	CF 22K OHM +-5% 1/16W	R149	0700041	CF 1K OHM +-5% 1/16W
R052	0700054	CF 10K OHM +-5% 1/16W	R150	0700041	CF 1K OHM +-5% 1/16W
R053	0700041	CF 1K OHM +-5% 1/16W	R151	0100059	CF 560 OHM +-5% 1/8W
R055	0700054	CF 10K OHM +-5% 1/16W	R152	0700022	CF 39 OHM +-5% 1/16W
R059	0700054	CF 10K OHM +-5% 1/16W	R153	0100065	CF 1K OHM +-5% 1/8W
R060	0700054	CF 10K OHM +-5% 1/16W	R157	0700034	CF 330 OHM +-5% 1/16W
R061	0700054	CF 10K OHM +-5% 1/16W	R158	0700041	CF 1K OHM +-5% 1/16W
R062	0700054	CF 10K OHM +-5% 1/16W	R159	0700051	CF 5.6K OHM +-5% 1/16W
R063	0700055	CF 12K OHM +-5% 1/16W	R161	0700041	CF 1K OHM +-5% 1/16W
R064	0700054	CF 10K OHM +-5% 1/16W	R166	0700054	CF 10K OHM +-5% 1/16W
R065	0700045	CF 2.2K OHM +-5% 1/16W	R167	0700054	CF 10K OHM +-5% 1/16W
R066	0700058	CF 22K OHM +-5% 1/16W	R168	0700054	CF 10K OHM +-5% 1/16W
R067	0700049	CF 4.7K OHM +-5% 1/16W	R169	0700037	CF 560 OHM +-5% 1/16W
R068	0700067	CF 100K OHM +-5% 1/16W	R170	0700027	CF 100 OHM +-5% 1/16W
R069	0700031	CF 180 OHM +-5% 1/16W	R171	0700029	CF 150 OHM +-5% 1/16W
R070	0700066	CF 82K OHM +-5% 1/16W	R175	0700058	CF 22K OHM +-5% 1/16W
R071	0700058	CF 22K OHM +-5% 1/16W	R176	0700058	CF 22K OHM +-5% 1/16W
R073	0700041	CF 1K OHM +-5% 1/16W	R177	0700027	CF 100 OHM +-5% 1/16W
R074	0700036	CF 470 OHM +-5% 1/16W	R178	0700063	CF 47K OHM +-5% 1/16W
R075	0700036	CF 470 OHM +-5% 1/16W	R180	0700027	CF 100 OHM +-5% 1/16W
R078	0700054	CF 10K OHM +-5% 1/16W	R181	0700027	CF 100 OHM +-5% 1/16W
R079	0700054	CF 10K OHM +-5% 1/16W	R185	0700054	CF 10K OHM +-5% 1/16W
R080	0100107	CF 56K OHM +-5% 1/8W	R186	0700041	CF 1K OHM +-5% 1/16W
R081	0700051	CF 5.6K OHM +-5% 1/16W	R188	0700054	CF 10K OHM +-5% 1/16W
R082	0700051	CF 5.6K OHM +-5% 1/16W	R189	0700063	CF 47K OHM +-5% 1/16W
R083	0700036	CF 470 OHM +-5% 1/16W	R190	0700051	CF 5.6K OHM +-5% 1/16W
R084	0700036	CF 470 OHM +-5% 1/16W	R192	0100041	CF 100 OHM +-5% 1/8W
R085	0700041	CF 1K OHM +-5% 1/16W	R193	0700027	CF 100 OHM +-5% 1/16W
R086	0700041	CF 1K OHM +-5% 1/16W	R195	0700054	CF 10K OHM +-5% 1/16W
R087	0700027	CF 100 OHM +-5% 1/16W	R3A5	0700041	CF 1K OHM +-5% 1/16W
R090	0700041	CF 1K OHM +-5% 1/16W	R3A6	0700041	CF 1K OHM +-5% 1/16W
R091	0700049	CF 4.7K OHM +-5% 1/16W	R3A7	0700041	CF 1K OHM +-5% 1/16W
R092	0700041	CF 1K OHM +-5% 1/16W	R3A8	0100119	CF 180K OHM +-5% 1/8W
R093	0700041	CF 1K OHM +-5% 1/16W	R3A9	0700042	CF 1.2K OHM +-5% 1/16W
R094	0700041	CF 1K OHM +-5% 1/16W	R3B1	0700027	CF 100 OHM +-5% 1/16W
R095	0700056	CF 15K OHM +-5% 1/16W	R3B2	0700032	CF 220 OHM +-5% 1/16W
R096	0700054	CF 10K OHM +-5% 1/16W	R3B3	0700055	CF 12K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R3B5	0700054	CF 10K OHM +-5% 1/16W	R384	0700039	CF 820 OHM +-5% 1/16W
R3B6	0700063	CF 47K OHM +-5% 1/16W	R385	0700043	CF 1.5K OHM +-5% 1/16W
R3B7	0700063	CF 47K OHM +-5% 1/16W	R386	0114135	CF 150 OHM +-5% 1/4W
R301	0700041	CF 1K OHM +-5% 1/16W	R387	0700037	CF 560 OHM +-5% 1/16W
R302	0700041	CF 1K OHM +-5% 1/16W	R388	0700027	CF 100 OHM +-5% 1/16W
R303	0700041	CF 1K OHM +-5% 1/16W	R389	0700063	CF 47K OHM +-5% 1/16W
R304	0700029	CF 150 OHM +-5% 1/16W	R390	0100055	CF 390 OHM +-5% 1/8W
R305	0700054	CF 10K OHM +-5% 1/16W	R391	0100115	CF 120K OHM +-5% 1/8W
R306	0700058	CF 22K OHM +-5% 1/16W	R392	0700041	CF 1K OHM +-5% 1/16W
R307	0700058	CF 22K OHM +-5% 1/16W	R393	0700052	CF 6.8K OHM +-5% 1/16W
R308	0700046	CF 2.7K OHM +-5% 1/16W	R394	0700046	CF 2.7K OHM +-5% 1/16W
R309	0700054	CF 10K OHM +-5% 1/16W	R395	0700043	CF 1.5K OHM +-5% 1/16W
R310	0700065	CF 68K OHM +-5% 1/16W	R396	0700061	CF 33K OHM +-5% 1/16W
R311	0700061	CF 33K OHM +-5% 1/16W	R397	0700057	CF 18K OHM +-5% 1/16W
R312	0700029	CF 150 OHM +-5% 1/16W	R398	0100121	CF 220K OHM +-5% 1/8W
R313	0700049	CF 4.7K OHM +-5% 1/16W	R425	0700054	CF 10K OHM +-5% 1/16W
R314	0700046	CF 2.7K OHM +-5% 1/16W	R426	0700054	CF 10K OHM +-5% 1/16W
R315	0700033	CF 270 OHM +-5% 1/16W	R453	0700041	CF 1K OHM +-5% 1/16W
R316	0700041	CF 1K OHM +-5% 1/16W	R454	0700041	CF 1K OHM +-5% 1/16W
R317	0700061	CF 33K OHM +-5% 1/16W	R466	0700041	CF 1K OHM +-5% 1/16W
R318	0700042	CF 1.2K OHM +-5% 1/16W	R467	0700041	CF 1K OHM +-5% 1/16W
R319	0700064	CF 56K OHM +-5% 1/16W	R471	0700054	CF 10K OHM +-5% 1/16W
R320	0700065	CF 68K OHM +-5% 1/16W	R472	0700054	CF 10K OHM +-5% 1/16W
R321	0700064	CF 56K OHM +-5% 1/16W	R473	0700051	CF 5.6K OHM +-5% 1/16W
R322	0700058	CF 22K OHM +-5% 1/16W	R474	0700051	CF 5.6K OHM +-5% 1/16W
R323	0700054	CF 10K OHM +-5% 1/16W	R475	0700045	CF 2.2K OHM +-5% 1/16W
R324	0700058	CF 22K OHM +-5% 1/16W	R476	0700045	CF 2.2K OHM +-5% 1/16W
R325	0150114	VR 10K OHM-B	R477	0700063	CF 47K OHM +-5% 1/16W
R326	0700062	CF 39K OHM +-5% 1/16W	R478	0700067	CF 100K OHM +-5% 1/16W
R327	0700059	CF 27K OHM +-5% 1/16W	R479	0700036	CF 470 OHM +-5% 1/16W
R328	0700046	CF 2.7K OHM +-5% 1/16W	R480	1195051	FR 2.2 OHM +-5% 1/4W
R329	0700047	CF 3.3K OHM +-5% 1/16W	R481	1195051	FR 2.2 OHM +-5% 1/4W
R330	0700029	CF 150 OHM +-5% 1/16W	R482	0700063	CF 47K OHM +-5% 1/16W
R331	0700049	CF 4.7K OHM +-5% 1/16W	R483	0700041	CF 1K OHM +-5% 1/16W
R332	0700049	CF 4.7K OHM +-5% 1/16W	R484	0700058	CF 22K OHM +-5% 1/16W
R333	0150115	VR 20K OHM-B	R485	0700065	CF 68K OHM +-5% 1/16W
R334	0700051	CF 5.6K OHM +-5% 1/16W	R486	0700065	CF 68K OHM +-5% 1/16W
R335	0700049	CF 4.7K OHM +-5% 1/16W	R487	0114161	CF 1K OHM +-5% 1/4W
R336	0100133	CF 680K OHM +-5% 1/8W	R488	0114161	CF 1K OHM +-5% 1/4W
R337	0700058	CF 22K OHM +-5% 1/16W	R501	0187086	CF 7.5K OHM +-5% 1/16W
R338	0700054	CF 10K OHM +-5% 1/16W	R502	0150110	VR 500 OHM-B
R339	0700066	CF 82K OHM +-5% 1/16W	R503	0700036	CF 470 OHM +-5% 1/16W
R340	0700054	CF 10K OHM +-5% 1/16W	R505	0150110	VR 500 OHM-B
R341	0700067	CF 100K OHM +-5% 1/16W	R506	0150111	VR 1K OHM-B
R342	0700052	CF 6.8K OHM +-5% 1/16W	R507	0700067	CF 100K OHM +-5% 1/16W
R344	0700049	CF 4.7K OHM +-5% 1/16W	R508	0700036	CF 470 OHM +-5% 1/16W
R346	0700067	CF 100K OHM +-5% 1/16W	R509	0700041	CF 1K OHM +-5% 1/16W
R347	0700046	CF 2.7K OHM +-5% 1/16W	R510	0179536	MG 1M OHM +-5% 1/8W
R348	0700049	CF 4.7K OHM +-5% 1/16W	R513	0700041	CF 1K OHM +-5% 1/16W
R351	0700048	CF 3.9K OHM +-5% 1/16W	R514	0100129	CF 470K OHM +-5% 1/8W
R352	0700047	CF 3.3K OHM +-5% 1/16W	R516	0700066	CF 82K OHM +-5% 1/16W
R353	0700041	CF 1K OHM +-5% 1/16W	R517	0700054	CF 10K OHM +-5% 1/16W
R355	0700048	CF 3.9K OHM +-5% 1/16W	R518	0700067	CF 100K OHM +-5% 1/16W
R356	0700051	CF 5.6K OHM +-5% 1/16W	R519	0700061	CF 33K OHM +-5% 1/16W
R357	0700054	CF 10K OHM +-5% 1/16W	R520	0700067	CF 100K OHM +-5% 1/16W
R358	0179536	MG 1M OHM +-5% 1/8W	R521	0700054	CF 10K OHM +-5% 1/16W
R359	0700034	CF 330 OHM +-5% 1/16W	R522	0700065	CF 68K OHM +-5% 1/16W
R361	0700034	CF 330 OHM +-5% 1/16W	R523	0700054	CF 10K OHM +-5% 1/16W
R362	0700034	CF 330 OHM +-5% 1/16W	R526	0700054	CF 10K OHM +-5% 1/16W
R363	0700027	CF 100 OHM +-5% 1/16W	R527	0700054	CF 10K OHM +-5% 1/16W
R364	0700054	CF 10K OHM +-5% 1/16W	R528	0700067	CF 100K OHM +-5% 1/16W
R365	0700039	CF 820 OHM +-5% 1/16W	R529	0700059	CF 27K OHM +-5% 1/16W
R366	0700041	CF 1K OHM +-5% 1/16W	R530	0700047	CF 3.3K OHM +-5% 1/16W
R367	0150113	VR 5K OHM-B RS-6	R531	0700049	CF 4.7K OHM +-5% 1/16W
R368	0700051	CF 5.6K OHM +-5% 1/16W	R532	0700061	CF 33K OHM +-5% 1/16W
R369	0700033	CF 270 OHM +-5% 1/16W	R533	0700046	CF 2.7K OHM +-5% 1/16W
R371	0700041	CF 1K OHM +-5% 1/16W	R534	0700054	CF 10K OHM +-5% 1/16W
R374	0700047	CF 3.3K OHM +-5% 1/16W	R535	0700054	CF 10K OHM +-5% 1/16W
R375	0100125	CF 330K OHM +-5% 1/8W	R538	0100037	CF 68 OHM +-5% 1/8W
R376	0700041	CF 1K OHM +-5% 1/16W	R539	0100049	CF 220 OHM +-5% 1/8W
R381	0100051	CF 270 OHM +-5% 1/8W	R540	0100049	CF 220 OHM +-5% 1/8W
R382	0700062	CF 39K OHM +-5% 1/16W	R541	0100049	CF 220 OHM +-5% 1/8W
R383	0700038	CF 680 OHM +-5% 1/16W	R543	0700027	CF 100 OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R544	0700054	CF 10K OHM +-5% 1/16W	R728	0700045	CF 2.2K OHM +-5% 1/16W
R545	0700054	CF 10K OHM +-5% 1/16W	R729	0700047	CF 3.3K OHM +-5% 1/16W
R548	0700054	CF 10K OHM +-5% 1/16W	R730	0113729	CF 150 OHM +-5% 1/2W
R549	0700029	CF 150 OHM +-5% 1/16W	R731	0110101	MF 15 OHM +-5% 1W
R550	0700066	CF 82K OHM +-5% 1/16W	R734	0110145	MF 1K OHM +-5% 1W
R609	0100065	CF 1K OHM +-5% 1/8W	R735	0110129	MF 220 OHM +-5% 1W
R610	0700061	CF 33K OHM +-5% 1/16W	R736	0110151	MF 1.8K OHM +-5% 1W
R611	0700064	CF 56K OHM +-5% 1/16W	⚠ R741	0700046	CF 2.7K OHM +-5% 1/16W
R613	0700065	CF 68K OHM +-5% 1/16W	R742	0100087	CF 8.2K OHM +-5% 1/8W
R614	0700061	CF 33K OHM +-5% 1/16W	R743	0700051	CF 5.6K OHM +-5% 1/16W
R615	0700038	CF 680 OHM +-5% 1/16W	R744	0700052	CF 6.8K OHM +-5% 1/16W
R616	0700064	CF 56K OHM +-5% 1/16W	R745	0700056	CF 15K OHM +-5% 1/16W
R617	0119722	MF 1 OHM +-5% 1W	R746	0114139	CF 220 OHM +-5% 1/4W
R618	0119722	MF 1 OHM +-5% 1W	R801	0140326S	MF 5.6K OHM +-5% 5W
R619	0700027	CF 100 OHM +-5% 1/16W	R803	0113744	CF 560 OHM +-5% 1/2W
R620	0700054	CF 10K OHM +-5% 1/16W	R806	0113815	CF 470K OHM +-5% 1/2W
R621	0700051	CF 5.6K OHM +-5% 1/16W	R809	0100065	CF 1K OHM +-5% 1/8W
R622	0700065	CF 68K OHM +-5% 1/16W	R810	0100035	CF 56 OHM +-5% 1/8W
R623	0113766	CF 4.7K OHM +-5% 1/2W	R811	0100065	CF 1K OHM +-5% 1/8W
R624	0110121	MF 100 OHM +-5% 1W	R812	0100044	CF 130 OHM +-5% 1/8W
R625	0113725	CF 100 OHM +-5% 1/2W	R815	0100059	CF 560 OHM +-5% 1/8W
R626	0113725	CF 100 OHM +-5% 1/2W	R817	0100041	CF 100 OHM +-5% 1/8W
R627	0113725	CF 100 OHM +-5% 1/2W	R818	0100049	CF 220 OHM +-5% 1/8W
R635	0100053	CF 330 OHM +-5% 1/8W	R831	0140326S	MF 5.6K OHM +-5% 5W
R636	0100063	CF 820 OHM +-5% 1/8W	R833	0113744	CF 560 OHM +-5% 1/2W
R637	0700044	CF 1.8K OHM +-5% 1/16W	R836	0113815	CF 470K OHM +-5% 1/2W
R638	0700058	CF 22K OHM +-5% 1/16W	R840	0100035	CF 56 OHM +-5% 1/8W
R639	0700041	CF 1K OHM +-5% 1/16W	R841	0100065	CF 1K OHM +-5% 1/8W
R640	0700041	CF 1K OHM +-5% 1/16W	R842	0100033	CF 47 OHM +-5% 1/8W
R642	0700061	CF 33K OHM +-5% 1/16W	⚠ R843	0150001	VR 200 OHM-B
R643	0700056	CF 15K OHM +-5% 1/16W	R845	0100059	CF 560 OHM +-5% 1/8W
R646	0700045	CF 2.2K OHM +-5% 1/16W	R847	0100041	CF 100 OHM +-5% 1/8W
R647	0700054	CF 10K OHM +-5% 1/16W	R861	0140326S	MF 5.6K OHM +-5% 5W
R652	0700063	CF 47K OHM +-5% 1/16W	R863	0113744	CF 560 OHM +-5% 1/2W
R653	0700041	CF 1K OHM +-5% 1/16W	R866	0113815	CF 470K OHM +-5% 1/2W
R654	0700047	CF 3.3K OHM +-5% 1/16W	R870	0100035	CF 56 OHM +-5% 1/8W
R655	0700067	CF 100K OHM +-5% 1/16W	R871	0100065	CF 1K OHM +-5% 1/8W
R656	0700045	CF 2.2K OHM +-5% 1/16W	R872	0100033	CF 47 OHM +-5% 1/8W
R658	0114135	CF 150 OHM +-5% 1/4W	⚠ R873	0150001	VR 200 OHM-B
R659	0100045	CF 150 OHM +-5% 1/8W	R875	0100059	CF 560 OHM +-5% 1/8W
R660	0119731	FR 0.68 OHM 1W	R877	0100049	CF 220 OHM +-5% 1/8W
R661	0700054	CF 10K OHM +-5% 1/16W	R903	0147060	WW 33 OHM +-5% 2W
R662	0700041	CF 1K OHM +-5% 1/16W	⚠ R904	0147804	WW 0.75 OHM 15W
R663	0700059	CF 27K OHM +-5% 1/16W	R905	0148009	WW 0.056 OHM 2W
R664	0700041	CF 1K OHM +-5% 1/16W	R906	0700037	CF 560 OHM +-5% 1/16W
R665	0700054	CF 10K OHM +-5% 1/16W	R907	0700046	CF 2.7K OHM +-5% 1/16W
R666	0700059	CF 27K OHM +-5% 1/16W	R908	0700054	CF 10K OHM +-5% 1/16W
R667	0119732	MF 1.2 OHM +-10% 1W	R909	0700047	CF 3.3K OHM +-5% 1/16W
R701	0700039	CF 820 OHM +-5% 1/16W	R911	0700049	CF 4.7K OHM +-5% 1/16W
R702	0700041	CF 1K OHM +-5% 1/16W	R912	0700049	CF 4.7K OHM +-5% 1/16W
R703	0113770	CF 6.8K OHM +-5% 1/2W	R913	0110169	MF 10K OHM +-5% 1W
R704	0110355	MF 2.7K OHM +-5% 3W	R914	0700023	CF 47 OHM +-5% 1/16W
R705	0110351	MF 1.8K OHM +-5% 3W	R915	0700027	CF 100 OHM +-5% 1/16W
⚠ R706	0119688	MF 0.22 OHM +-5% 1W	R916	0700036	CF 470 OHM +-5% 1/16W
R707	0100031	CF 39 OHM +-5% 1/8W	R917	0700061	CF 33K OHM +-5% 1/16W
R708	0113791	CF 47K OHM +-5% 1/2W	R918	0114161	CF 1K OHM +-5% 1/4W
R709	0113785	CF 27K OHM +-5% 1/2W	R920	0110237	MF 470 OHM +-5% 2W
R710	0110229	MF 220 OHM +-5% 2W	R921	0700057	CF 18K OHM +-5% 1/16W
⚠ R711	1195121	FR 1 OHM +-5% 1/4W	R922	0700057	CF 18K OHM +-5% 1/16W
⚠ R712	0119514	FR 10 OHM +-5% 1/4W	R923	0700047	CF 3.3K OHM +-5% 1/16W
R713	0113717	CF 47 OHM +-5% 1/2W	R924	0700047	CF 3.3K OHM +-5% 1/16W
⚠ R714	0700063	CF 47K OHM +-5% 1/16W	R932	0110145	MF 1K OHM +-5% 1W
R715	0100085	CF 6.8K OHM +-5% 1/8W	⚠ R934	0119839	MF 0.56 OHM +-5% 1W
R716	0700042	CF 1.2K OHM +-5% 1/16W	R935	0700054	CF 10K OHM +-5% 1/16W
R717	0114149	CF 560 OHM +-5% 1/4W	R936	0700058	CF 22K OHM +-5% 1/16W
R718	0100127	CF 390K OHM +-5% 1/8W	R937	0700063	CF 47K OHM +-5% 1/16W
R719	0700054	CF 10K OHM +-5% 1/16W	⚠ R938	0113797	CF 82K OHM +-5% 1/2W
R721	0110365	MF 6.8K OHM +-5% 3W	⚠ R939	0700051	CF 5.6K OHM +-5% 1/16W
R723	0110215	MF 56 OHM +-5% 2W	R940	0700054	CF 10K OHM +-5% 1/16W
R724	0114177	CF 4.7K OHM +-5% 1/4W	R941	0700054	CF 10K OHM +-5% 1/16W
R725	0700052	CF 6.8K OHM +-5% 1/16W	R942	0700058	CF 22K OHM +-5% 1/16W
R726	0700048	CF 3.9K OHM +-5% 1/16W	R943	0700036	CF 470 OHM +-5% 1/16W
R727	0700049	CF 4.7K OHM +-5% 1/16W	R944	0700041	CF 1K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
⚠ R945	0700039	CF 820 OHM +-5% 1/16W
⚠ R946	0700043	CF 1.5K OHM +-5% 1/16W
R947	0700041	CF 1K OHM +-5% 1/16W
R948	0700045	CF 2.2K OHM +-5% 1/16W
R949	0700038	CF 680 OHM +-5% 1/16W
R950	0700039	CF 820 OHM +-5% 1/16W
R951	0700049	CF 4.7K OHM +-5% 1/16W
R952	0700043	CF 1.5K OHM +-5% 1/16W
R953	0700051	CF 5.6K OHM +-5% 1/16W
R954	0700051	CF 5.6K OHM +-5% 1/16W
R956	0700045	CF 2.2K OHM +-5% 1/16W
R958	0700067	CF 100K OHM +-5% 1/16W
R959	0700051	CF 5.6K OHM +-5% 1/16W
R972	0110145	MF 1K OHM +-5% 1W
R973	0700042	CF 1.2K OHM +-5% 1/16W
R978	0700052	CF 6.8K OHM +-5% 1/16W
R980	0700045	CF 2.2K OHM +-5% 1/16W
		IC'S
IK04	2003191	IC STK4274 (LINEAR)
IK05	2003191	IC STK4274 (LINEAR)
IK06	2003191	IC STK4274 (LINEAR)
IK07	2380391	IC UPD6326C
IT01	2383191	IC LA7990
IT02	2914051	IC NJM4560D
IT03	2914051	IC NJM4560D
IT04	2914051	IC NJM4560D
IT05	2914051	IC NJM4560D
IT06	CP01631R	IC PST9142-T (HHEA MD)
IW01	CP00811	IC UPC1852BCT (HHEA MD)
IY01	2020452	IC CXA1545AS
I001	CP01191	IC MN1874862HHM3 (HHEA MD)
I002	2366301	IC UPD4052BC
I003	CP00822	IC M6M80042P (HHEA MD)
I004	2000541	IC M51951BSL
I005	2381141	HD74HC32P
I401	2020001	IC TDA9860
I402	2004751	IC TA8200AH
I501	2020324	IC YAT016H
I503	2004665	IC PQ09RF21
I504	2003421	IC UPC7805AHF
I601	2003541	IC LA7838 (LINEAR)
⚠ I901	2373343	MODULE STR-M6511
⚠ I902	2000465	IC PS2501-1 (KD/LD) (PHOTO COUPLER)
⚠ I903	2000465	IC PS2501-1 (KD/LD) (PHOTO COUPLER)
⚠ I904	2381343	IC SE115N
I906	2003413	IC UPC7912HF
I907	2003424	IC UPC7812AHF (LINEAR)
		TRANSISTORS
QA01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA02	2320637	TR 2SA673C/D SI 80MHZ 400MW
QA03	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA04	2320637	TR 2SA673C/D SI 80MHZ 400MW
QA05	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA06	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC02	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC03	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC04	2326871	TR DTC124ES
QC05	2320591	TR 2SC458B/C SI 230MHZ 200MW
⚠ QF01	2314991	TR 2SC4630
QF02	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF03	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF04	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF05	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF06	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF07	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF08	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF09	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF10	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF11	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QM01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QM02	2312992	TR PHOTO TRANSISTOR PRT-38PT3F(M)
QN01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN02	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN03	2320637	TR 2SA673C/D SI 80MHZ 400MW
QN04	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN05	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN06	2320637	TR 2SA673C/D SI 80MHZ 400MW
QT01	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT02	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT03	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT04	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT05	2320681	TR 2SA673A B/C SI 80MHZ 400MW
QT06	2320681	TR 2SA673A B/C SI 80MHZ 400MW
QT07	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT08	2320681	TR 2SA673A B/C SI 80MHZ 400MW
QT11	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT12	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT13	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT14	2320595	TR 2SC458(D) SI 230MHZ 200MW
QY01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QY07	2326021	TR 2SC1741S
QY08	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q001	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q002	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q003	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q004	2320643	TR 2SC1213C SI 80MHZ 400MW
Q005	2320643	TR 2SC1213C SI 80MHZ 400MW
Q006	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q007	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q009	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q011	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q014	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q015	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q016	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q017	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q018	2320598	TR 2SC458B/C/D SI 230MHZ 200MW
Q019	2323521	TR 2SD789 B/C/D/E
Q021	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q023	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q024	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q301	2326871	TR DTC124ES
Q302	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q303	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q304	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q305	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q306	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q307	2326871	TR DTC124ES
Q308	2326871	TR DTC124ES
Q309	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q312	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q313	2326021	TR 2SC1741S
Q314	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q315	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q316	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q318	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q319	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q419	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q420	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q421	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q422	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q504	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q505	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q506	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q604	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q605	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q606	2312177	TR 2SD 2375 LD P (HHEA MD)
Q607	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q609	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q610	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q612	2320591	TR 2SC458B/C SI 230MHZ 200MW

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SYMBOL NO.	PART NO.	PART DESCRIPTION
Q701	2326216	TR 2SC3116 S/T
Q704	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q705	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q706	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q707	2320637	TR 2SA673C/D SI 80MHZ 400MW
⚠ Q777	2315274F	TR 2SC4589-05
Q801	2312372F	TR 2SC3942
Q802	2320663	TR 2SC1213AC SI 80MHZ 400MW
Q803	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q804	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q831	2312372F	TR 2SC3942
Q832	2320663	TR 2SC1213AC SI 80MHZ 400MW
Q833	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q861	2312372F	TR 2SC3942
Q862	2320663	TR 2SC1213AC SI 80MHZ 400MW
Q863	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q901	2320665	TR 2SC1213A(D)
Q902	2312171	TR 2SC3852
⚠ Q903	2323782	TR 03P2M
⚠ Q909	2321112	TR 2SA778A
Q912	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q913	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q914	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q915	2312177	TR 2SD 2375 LD P (HHEA MD)
		DIODES
DA01	2398611	DI 1SS254
DA02	2398611	DI 1SS254
DA03	2339812M	ZD HZS3A2
DA04	2339812M	ZD HZS3A2
DC01	2398611	DI 1SS254
DC02	2398611	DI 1SS254
DF01	2398611	DI 1SS254
DF02	2398611	DI 1SS254
DF03	2398611	DI 1SS254
DF04	2398611	DI 1SS254
DF05	2398611	DI 1SS254
DF06	2398611	DI 1SS254
DK04	CH00172M	DI DFM1SD2
DK05	CH00172M	DI DFM1SD2
DK06	2334324	ZD RD36EB3
DK07	2334324	ZD RD36EB3
DK08	2334324	ZD RD36EB3
DK09	2334324	ZD RD36EB3
DK10	2334324	ZD RD36EB3
DK11	2334324	ZD RD36EB3
DK12	2334324	ZD RD36EB3
DK13	2334324	ZD RD36EB3
DK14	2334324	ZD RD36EB3
DK15	2334324	ZD RD36EB3
DK16	2334324	ZD RD36EB3
DK17	2334324	ZD RD36EB3
DK18	2331797	ZD HZ5C1
DK32	2398611	DI 1SS254
DM01	2398611	DI 1SS254
DM02	2398611	DI 1SS254
DM03	2339691	LED SLH-56VC77F
DM04	2339889	ZD HZS12C3
DN01	2398611	DI 1SS254
DN02	2398611	DI 1SS254
DN03	2398611	DI 1SS254
DN04	2398611	DI 1SS254
DN05	2398611	DI 1SS254
DN06	2339825	ZD HZS4B2
DN07	2398611	DI 1SS254
DN08	CH00151M	DI DSM1SD2
DN09	2331849	ZD HZ-12(C3)
DN10	2398611	DI 1SS254
DT01	23383211	DI 1SS270
DT02	23383211	DI 1SS270
DT03	23383211	DI 1SS270
DT04	23383211	DI 1SS270
DT05	23383211	DI 1SS270
DT06	23383211	DI 1SS270
DT07	23383211	DI 1SS270
DT08	23383211	DI 1SS270
DT09	23383211	DI 1SS270
DT11	2334285	ZD RD24EB4
DT12	2334285	ZD RD24EB4
DT13	2334285	ZD RD24EB4
DT14	2334285	ZD RD24EB4
DT15	2334285	ZD RD24EB4
DT16	2334285	ZD RD24EB4
DT17	2334285	ZD RD24EB4
DT18	2334285	ZD RD24EB4
DT19	2334285	ZD RD24EB4
DT20	2334285	ZD RD24EB4
DT21	2334285	ZD RD24EB4
DT22	2334285	ZD RD24EB4
D002	2339889	ZD HZS12C3
D003	2339889	ZD HZS12C3
D004	2339889	ZD HZS12C3
D005	2339889	ZD HZS12C3
D006	2339889	ZD HZS12C3
D008	2398611	DI 1SS254
D009	2398611	DI 1SS254
D010	2398611	DI 1SS254
D011	2398611	DI 1SS254
D013	2398611	DI 1SS254
D014	2398611	DI 1SS254
D016	2398611	DI 1SS254
D022	2398611	DI 1SS254
D024	2398611	DI 1SS254
D025	2398611	DI 1SS254
D026	2398611	DI 1SS254
D027	2339839	ZD HZS5C3
D028	2398611	DI 1SS254
D031	2398611	DI 1SS254
D032	2398611	DI 1SS254
D033	2339849	ZD HZS6C3
D034	2335991	ZD HZT-33
D037	2398611	DI 1SS254
D038	2398611	DI 1SS254
D039	2398611	DI 1SS254
D040	2398611	DI 1SS254
D041	2398611	DI 1SS254
D301	2398611	DI 1SS254
D302	2339855	ZD HZS7B2
D303	2398611	DI 1SS254
D304	2398611	DI 1SS254
D305	2398611	DI 1SS254
D306	2398611	DI 1SS254
D307	2398611	DI 1SS254
D308	2398611	DI 1SS254
D309	2398611	DI 1SS254
D310	2339839	ZD HZS5C3
D315	2398611	DI 1SS254
D316	2398611	DI 1SS254
D318	2398611	DI 1SS254
D319	2398611	DI 1SS254
D320	2334324	ZD RD36EB3
D401	CH00151M	DI DSM1S02
D402	2398611	DI 1SS254
D403	2398611	DI 1SS254
D404	2398611	DI 1SS254
D405	2398611	DI 1SS254
D406	2398611	DI 1SS254
D407	2398611	DI 1SS254
D408	2398611	DI 1SS254
D409	2398611	DI 1SS254
D410	2398611	DI 1SS254
D411	2398611	DI 1SS254
D502	2398611	DI 1SS254
D503	2398611	DI 1SS254
D504	2339839	ZD HZS5C3

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SYMBOL NO.	PART NO.	PART DESCRIPTION
D505	2331827	ZD HZ-9 (C1)
D506	2331827	ZD HZ-9 (C1)
D507	2331827	ZD HZ-9 (C1)
D511	CH00151M	DI DSM1SD2
D601	2334243	ZD RD16E(B2)
D602	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
D603	2398611	DI 1SS254
D604	2331807	ZD HZ-6 (C1)
D605	CH00151M	DI DSM1SD2
D606	CH00151M	DI DSM1SD2
D607	CH00151M	DI DSM1SD2
D608	CH00031M	DI AU02V1 (HHEA MD) (HSCC MD) (YOKOHAMA)
D609	2334305	ZD RD30E (B4)
D610	2398611	DI 1SS254
D611	2398611	DI 1SS254
D612	2398611	DI 1SS254
D614	2398611	DI 1SS254
D615	2398611	DI 1SS254
D616	2398611	DI 1SS254
D701	2398611	DI 1SS254
⚠ D702	2348511	DI RS3FS
⚠ D703	2359371	DI S3L60 (HHEA MD) (YOKOHAMA)
⚠ D704	2359371	DI S3L60 (HHEA MD) (YOKOHAMA)
D705	CH00041M	DI ES1FV1 (HHEA MD) (YOKOHAMA)
D706	CH00041M	DI ES1FV1 (HHEA MD) (YOKOHAMA)
⚠ D708	CH00031	DI AU02 (280V) (HHEA MD) (HSCC MD)
⚠ D709	CH00031M	DI AU02V1 (HHEA MD) (HSCC MD) (YOKOHAMA)
⚠ D710	2335042	ZD HZ22 (2L)
D711	2339612M	ZD HZS3BLL
D712	CH00151M	DI DSM1SD2
D713	2398611	DI 1SS254
D714	CH00172M	DI DFM1SD2
D715	2339887	ZD HZS12C1
D716	2398611	DI 1SS254
D717	2398611	DI 1SS254
D718	2398611	DI 1SS254
D719	2398611	DI 1SS254
D801	2331827	ZD HZ-9 (C1)
D802	23383211	DI 1SS270
D805	23383211	DI 1SS270
D831	2331827	ZD HZ-9 (C1)
D832	23383211	DI 1SS270
D861	2331827	ZD HZ-9 (C1)
D862	23383211	DI 1SS270
⚠ D901	2342061	DI D3SB(A)60
D902	CH00172M	DI DFM1SD2
D903	2398611	DI 1SS254
D904	2398611	DI 1SS254
D905	CH00172M	DI DFM1SD2
D906	2334304	ZD RD30EB3
D907	2331827	ZD HZ-9 (C1)
D909	CH00151M	DI DSM1SD2
D912	2339885	ZD HZS12B2
⚠ D913	2359401	DI FMP-G12S
⚠ D914	2359401	DI FMP-G12S
⚠ D915	2359401	DI FMP-G12S
⚠ D916	2349861	DI FMU-G16S
⚠ D917	2359401	DI FMP-G12S
⚠ D918	2359401	DI FMP-G12S
D920	CH00151M	DI DSM1SD2
D921	2339222	ZD HZS27-2L
D922	2339961M	ZD HZS30-1 TA (HHEA MD)
D923	2398611	DI 1SS254
D924	2339855	ZD HZS7B2
D925	2398611	DI 1SS254
D926	2398611	DI 1SS254
D927	2398611	DI1SS254
D928	2339892M	ZD HZS15-2 TA
D929	2398611	DI 1SS254
D930	2398611	DI 1SS254
D931	2398611	DI 1SS254
⚠ D932	2339961M	ZD HZS30-1 TA (HHEA MD)
D933	2398611	DI 1SS254

SYMBOL NO.	PART NO.	PART DESCRIPTION
⚠ D934	2339042	ZD HZS7A2L
D935	2398611	DI 1SS254
D936	2398611	DI 1SS254
D937	2398611	DI 1SS254
D938	2398611	DI 1SS254
D939	2398611	DI 1SS254
D940	2339981	ZD HZS36-1
D941	CH00172M	DI DFM1SD2
D942	CH00172M	DI DFM1SD2
D943	2398611	DI 1SS254
D944	2398611	DI 1SS254
D945	2398611	DI 1SS254
D946	CH00151M	DI DSM1SD2
D947	CH00151M	DI DSM1SD2
D948	CH00151M	DI DSM1SD2
D949	CH00151M	DI DSM1SD2
D950	2339697	LED SLH-56MC35H
D951	2339697	LED SLH-56MC35H
D952	2339697	LED SLH-56MC35H
D953	2339697	LED SLH-56MC35H
D954	2339697	LED SLH-56MC35H
D955	2331785	ZD HZ4(B2)
D956	2339983M	ZD HZS36-3 TA (HHEA MD)
D957	2398611	DI 1SS254
D958	2398611	DI 1SS254
D959	CH00172M	DI DFM1SD2
D968	2339892M	ZD HZS15-2 TA
D970	2339881M	ZD HZS12A1
D971	2339892M	ZD HZS15-2 TA
D972	2398611	DI 1SS254
D973	2331785	ZD HZ4(B2)
D974	2334304	ZD RD30EB3
D975	2339693	LED SLH-56VC35H
D976	2339855	ZD HZS7B2
D977	2398611	DI 1SS254
D978	2339942M	ZD HZS24-2 TA
		TRANSFORMERS
⚠ T701	2260291	HORIZONTAL DRIVE TRANSFORMER
⚠ T702	2436493	FLYBACK TRANSFORMER
⚠ T703	2272762	SPC TRANSFORMER
⚠ T901	BT00161	POWER TRANSFORMER (HHEA MD)
⚠ T902	BT00151	SWITCHING TRANSFORMER (HHEA MD)
		COMPOUND COMPONENTS
⚠ EFPK	AZ00003	CRX FOCUS PACK
HM01	2574762	REMOTE CONTROL RECEIVER
H001	2791754	DSS306-55B101M
H002	2791754	DSS306-55B101M
H003	2791754	DSS306-55B101M
H004	2791754	DSS306-55B101M
H005	2791754	DSS306-55B101M
H006	2791754	DSS306-55B101M
H008	2791754	DSS306-55B101M
H009	2791754	DSS306-55B101M
H010	2791754	DSS306-55B101M
H011	2791754	DSS306-55B101M
H012	2791754	DSS306-55B101M
⚠ H901	2793312	CAPRISTOR
H902	2793312	CAPRISTOR
U002	HP00092	P IN P UNIT KC-011S (HHEA MD)
		FUSES
⚠ F902	2722358	FUSE 5A
⚠ F903	FN00071R	FUSE 5A (HHEA MD)
⚠ F905	2722389M	FUSE 4A
⚠ F906	2722353	FUSE 1.6A

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
		COILS	9	4524911	HEXAGON FLANGEHEAD 4 x 12
			12	4137977	4 X 25 SELF TAPPING SCREW
LA02	2123763	RADIAL COIL 100MH	13	KS00043	MIRROR (50EX14BV)
LC01	2123763	RADIAL COIL 100MH	13	KS00044	MIRROR (55EX15K)
LC02	2123109M	LAL02 AXIAL COIL 33MH	15	4520771	4 x 18 TAPPING SCREW WITH WASHER (50EX14BV)
LK03	2120482	FILTER COIL 100 MICRO H +-10%	19	4331945	MIRROR HOLDER
LT01	2120484	FILTER COIL	20	4137975	4 x 16 TAPPING SCREW WITH WASHER
LT02	2120484	FILTER COIL	21	QD00532	CABINET ASS'Y (50EX14BV)
LT03	2120484	FILTER COIL	21	QD01411	CABINET ASS'Y (55EX15K)
LT06	2120484	FILTER COIL	22	QD01531	BACK COVER (55EX15K)
LW01	2123763	RADIAL COIL 100MH	23	H810191	8 X 5/8 PAN HEAD DRYWALL SCREW(55EX15K)
LY01	2123781	FILTER COIL	24	55050001	MIRROR BOARD
LY04	2123763	RADIAL COIL 100MH	26	55040002	MIRROR CLEAT
L001	2123781	FILTER COIL	27	NT00075	SCREEN FRAME ASS'Y (50EX14BV)
L003	2123763	RADIAL COIL 100MH	27	NT00076	SCREEN FRAME ASS'Y (55EX15K)
L301	2146092	TRAP COIL	28	H310902	EXTRUSION END CAP (L) (55EX15K)
L302	2123116M	LAL AXIAL COIL 100 MICRO H +-10%	29	H310512	END CAP (50EX14BV)
L303	2123763	RADIAL COIL 100MH	29	H310901	EXTRUSION END CAP (R) (55EX15K)
L402	2123461	FERRITE BEADS CORE	30	H310932	DECO RAIL (55EX15K)
L403	2123461	FERRITE BEADS CORE	30	H310933	DECO RAIL (50EX14BV)
L404	2123461	FERRITE BEADS CORE	⚠31	3393743	DELTA 77 A/B LENS ASS'Y (G)
L405	2123781	FILTER COIL	⚠32	3393744	DELTA 77 A/B LENS ASS'Y (R/B)
L502	2123763	RADIAL COIL 100MH	33	H310121	PLASTIC RIVET
L601	2123461	FERRITE BEADS CORE	34	H520482	LOWER REAR COVER (55EX15K)
L701	BH00212R	FILTER COIL (HHEA MD)	34	H520581	LOWER REAR BOARD ASS'Y (50EX14BV)
L702	2771893	FERRITE BEADS CORE	35	NJ00571	VCR CONNECTOR TUBE (50EX14BV)
L703	2771892	FERRITE BEADS CORE 004	36	55100027	MIDDLE SHELF (50EX14BV)
L704	2771892	FERRITE BEADS CORE 004	37	63066861	DOOR SLIDER (50EX14BV)
L705	2124181	CHOKE COIL	38	34020007	DOOR ASS'Y WITH HINGE (50EX14BV)
L706	2120484	FILTER COIL		4303211	CENTER RAIL METAL
L707	2122095	FILTER COIL 27 MICRO H		61020001	DUOMATIC HINGE
L708	2120482	FILTER COIL 100 MICRO H +-10%		61030001	DUOMATIC MOUNTING PLATE
L709	2122211	FILTER COIL 12 MICRO H +-10%		63066861	FLIPPER DOOR SLIDER
L710	BZ00315	LINEARITY COIL (HHEA MD)		63068861	PIVOT ROLLER
L711	BZ00314	LINEARITY COIL 140UH		84000002	METAL CATCH
L713	2121181	FILTER COIL		H410311	MAGNETIC LOU
L803	2123763	RADIAL COIL 100MH	⚠40	4876421	LENS CRT BLOCK ASS'Y (R)
⚠L901	BZ00571	LINE FILTER (HHEA MD)	⚠41	4876422	LENS CRT BLOCK ASS'Y (G)
⚠L902	BZ00561	LINE FILTER (HHEA MD)	⚠42	4876423	LENS CRT BLOCK ASS'Y (B)
L904	2122653	FERRITE BEADS CORE	45	3189764	SCREEN ASS'Y (50EX14BV)
L907	BH00201R	FILTER COIL (HHEA MD)	45	3189846	SCREEN ASS'Y (55EX15K)
L908	BH00201R	FILTER COIL (HHEA MD)	47	H310922	SPEAKER GRILL (55EX15K)
L909	BH00201R	FILTER COIL (HHEA MD)	47	32110021	SPEAKER GRILL (50EX14BV)
L912	BH00201R	FILTER COIL (HHEA MD)	54	MK00121	METAL SHELF SUPPORT
L913	BH00201R	FILTER COIL (HHEA MD)	55	H420671	MIRROR METAL A
L916	BH00214R	FILTER COIL 100MH	56	H420681	MIRROR METAL B
L917	BH00214R	FILTER COIL 100MH	EFUS	2687791	F-US ADAPTOR
L918	BH00214R	FILTER COIL 100MH	EF92	2721351	FUSE HOLDER
L923	BH00212R	FILTER COIL (HHEA MD)	EF96	2721351	FUSE HOLDER
L924	BH00214R	FILTER COIL 100MH	E10	2776542	VM MAGNET
L925	BH00214R	FILTER COIL 100MH	⚠E12	BY00501	DEFLECTION YOKE
L926	2161152	FILTER COIL	E301	HL00224	REMOTE CONTROL CLU-415
			⚠E801	2698671	CPT SOCKET
		SWITCHES	⚠E831	2698671	CPT SOCKET
			⚠E861	2698671	CPT SOCKET
SM01	FE00061	1P KEY SWITCH (HHEA MD)	E9BN	4520883	M3X12 SCREW WITH WASHER
SM02	FE00061	1P KEY SWITCH (HHEA MD)	E9DN	4520883	M3X12 SCREW WITH WASHER
SM03	FE00061	1P KEY SWITCH (HHEA MD)	E9IN	4520883	M3X12 SCREW WITH WASHER
SM04	FE00061	1P KEY SWITCH (HHEA MD)	E9IS	KL00051	IC SPRING
SM05	FE00061	1P KEY SWITCH (HHEA MD)	⚠E901	2972523	POWER SUPPLY CORD (HHEA MD)
SM06	FE00061	1P KEY SWITCH (HHEA MD)	E902	3772201	AC CORD HOLDER
SM07	FE00061	1P KEY SWITCH (HHEA MD)	E903	3739671	CORD HOLDER
SS01	2622441	SLIDE SWITCH	⚠GF01	CJ00071R	SPARK GAP
S301	FD00011	SLIDE SWITCH	⚠G701	CJ00071R	SPARK GAP
S901	2640576	RELAY (HHEA MD)	⚠G801	CJ00071R	SPARK GAP
			⚠G802	CJ00071R	SPARK GAP
		MISCELLANEOUS	⚠G831	CJ00071R	SPARK GAP
			⚠G832	CJ00071R	SPARK GAP
1	UE00453	CONTROL BLOCK	⚠G861	CJ00071R	SPARK GAP
2	81180100	HEX HEAD T-SCREW	⚠G862	CJ00071R	SPARK GAP
3	81180114	8 X 1/4 T-SCREW	JS01	ER00121	LEVER TERMINAL (HHEA MD)
4	NA03233	LENS CRT METAL (55EX15K)	JY01	ES00002	11P PIN JACK WITH S TERMINAL (HHEA MD)
4	4492092	LENS CRT METAL (50EX14BV)	NF02	4520883	M3X12 SCREW WITH WASHER

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
NK06	4520885	M3X16 SCREW			
N201	QR02291	INSTRUCTION BOOK			
N402	4520883	M3X12 SCREW WITH WASHER			
N502	4520883	M3X12 SCREW WITH WASHER			
N602	4520883	M3X12 SCREW WITH WASHER			
N604	4520883	M3X12 SCREW WITH WASHER			
N702	4520883	M3X12 SCREW WITH WASHER			
N704	4159425	3X16 TAPPING SCREW			
N730	4159427	3X10 TAPPING SCREW WITH WASHER			
N801	3763751	SK BINDER			
N803	4520883	M3X12 SCREW WITH WASHER			
PFJ	2902266	7P SUB MINI PLUG PIN			
PI1	2663821	2P PLUG PIN			
PI2	2663821	2P PLUG PIN			
PMB	2665272	4P PLUG PIN WITH BASE			
PMG	2665272	4P PLUG PIN WITH BASE			
PMR	2665272	4P PLUG PIN WITH BASE			
PP	2661752	PLUG PIN			
PP	2661752	PLUG PIN			
PP31	2661751	PLUG PIN WITH BASE			
PR	2661753	PIN PLUG WITH BASE			
PSD2	2674631	5P CONNECTOR			
PSD3	2674634	8P CONNECTOR			
PSD4	2674635	10P CONNECTOR			
PSD6	2674631	5P CONNECTOR			
PTS	2663821	2P PLUG PIN			
PY2	2902263	4P SUB MINI PLUG PIN			
PY2	2902263	4P SUB MINI PLUG PIN			
P802	2661756	1P PLUG PIN WITH BASE			
P832	2661756	1P PLUG PIN WITH BASE			
P862	2661756	1P PLUG PIN WITH BASE			
⚠ SP401	2415072	SPEAKER (L) (50EX14BV)			
⚠ SP401	2412921	SPEAKER (L) (55EX15K)			
⚠ SP402	2415072	SPEAKER (R) (50EX14BV)			
⚠ SP402	2412921	SPEAKER (R) (55EX15K)			
U001	2429691	FRONTEND V8-A68FT (HHEA MD) (HSCC MD)			
U301	CW00021	MODULE UGL-331KNT			
V1R	2471384	180CSB22R (KU)			
V1G	2471385	180CSB22G (KU)			
VIB	2471386	180CSB22B (KU)			
X001	2168831	CRYSTAL			
X301	2786685	CRYSTAL			
X501	2791501	CRYSTAL HC-49/U			
	UE01811	LENS CRT CHASSIS B. ASS'Y (50EX14BV)			
	UE01812	LENS CRT CHASSIS B. ASS'Y (55EX15K)			

NOTES

HITACHI

HITACHI

PA No. 0048

SERVICE MANUAL

50EX14BV
55EX15K

TSC

AP52 Chassis

R/C: CLU-415UI

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CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product Safety Notices" in this Service Manual.

SAFETY NOTICE
USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by a ⚠on the schematics and on the parts list in this Service Data and its supplements and bulletins. Before servicing the chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Manual.

*For continued x-radiation protection, replace picture tube with original type of Hitachi approved equivalent type.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PROJECTION COLOR TELEVISION

September 1995 HHEA - MANUFACTURING DIVISION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

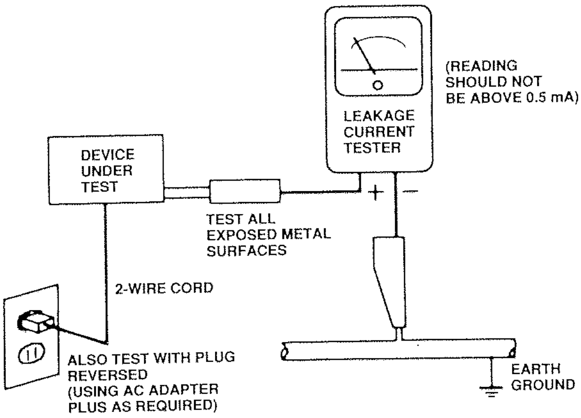
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with solder. Also, when soldering do not inhale any smoke or fumes produced.

This television receiver provides display of television closed captioning in accordance with section 5.119 of the FCC rules.

SAFETY PRECAUTIONS

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including but not limited to the following items:
   a. Be sure that no built-in protective devices are defective and/or have been deleted during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
   b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to (1) spacing between the picture tube and cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.
   c. **Antenna Cold Check** — With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohms or greater than 5.2 megohms, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.
   d. **Leakage Current Hot Check** — With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.0 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.1 milliamps. Reverse the instrument power cord plug in the outlet and repeat test.

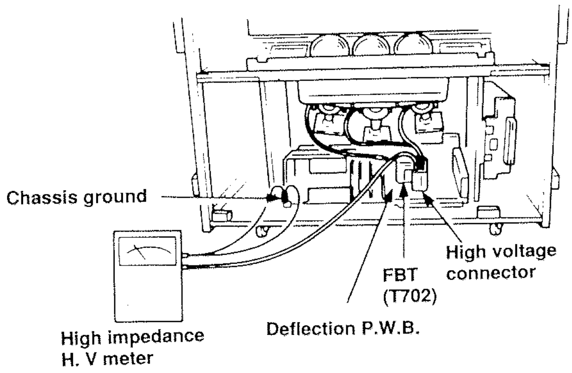

(READING SHOULD NOT BE ABOVE 0.5 mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
+
−
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUS AS REQUIRED)
EARTH GROUND

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

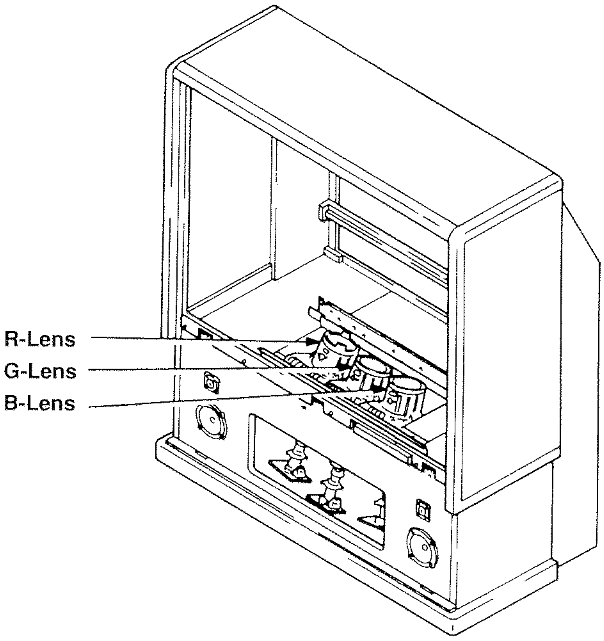
   e. **High Voltage** — This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.
   f. **Serviceman Warning** — With minimum contrast and brightness, operating high voltage in this receiver is lower than **31.6kV.** In case any component having influence on high voltage is replaced, confirm that high voltage with minimum contrast and brightness is lower than **31.6kV.**
   To measure H.V. use a high impedance H.V. meter. Connect (-) to chassis earth and (+) to the CRT anode button. (See the following connection diagram.)

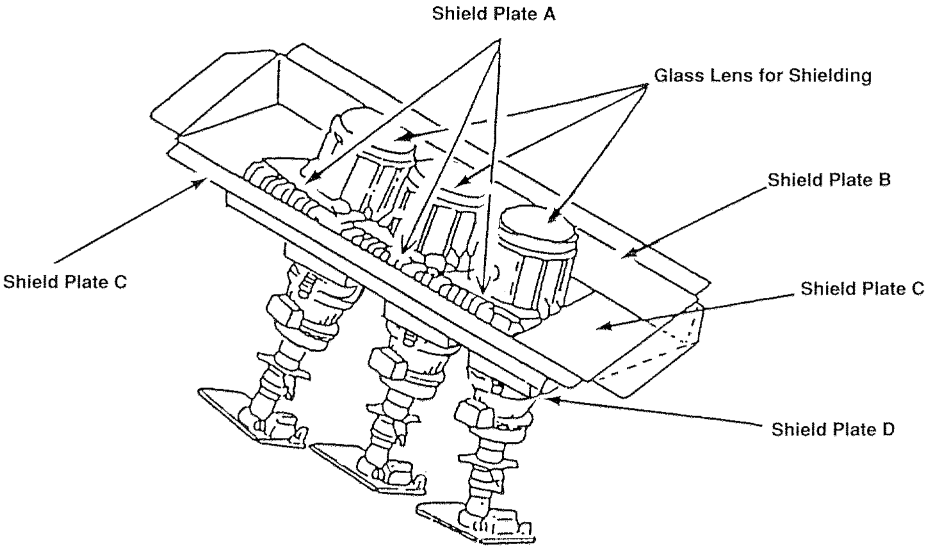
Note: Turn power switch off without fail before the connection to the anode button is made.



g. **X-radiation — TUBE:** The primary source of X radiation in this receiver is the picture tube. The tube utilized for the above mentioned function in this chassis is specially constructed to limit X radiation emissions.
For continued X radiation protection, the replacement tube must be the same type as the original, HITACHI approved type.
When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage component.
Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

h. **X-Radiation Shield** —
1) This receiver is provided X-ray shield plates for the protection of X-radiation. Do not remove X-ray shield plates A, B, C, or D shown in Fig. 1 unnecessarily, when troubleshooting and/or making test measurements.
2) To prevent X-radiation, after replacement of picture tube and lens, confirm these components to be fixed correctly to bracket and cabinet, and not to be taken off easily.





Detailing X-radiation shield.
Fig. 1

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning** — Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connectors, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4. **Picture Tube Implosion Protection Warning** — The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck.

5. **Hot Chassis Warning** — **a.** Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safety serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground. **b.** Some TV receiver chassis normally have 85V AC (RMS) between chassis and earth ground regardless of the AC plug polarity. These chassis can be safely serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection. **c.** Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: **a.** near sharp edges, **b.** near thermally hot parts — be sure that leads and components do not touch thermally hot parts, **c.** the AC supply, **d.** high voltage and **e.** antenna wiring. Always inspect in all areas for pinched, out-of-plate, or frayed wiring. Do not change spacing between components, and between components and the printed circuit board. Check AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. **PRODUCT SAFETY NOTICE** — Many TV electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified Hitachi service data by shading on schematics and by a (⚠) in the parts list. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in Hitachi service data parts list might create shock, fire, and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current Hitachi service literature. A subscription to, or additional copies of Service literature may be obtained at a nominal charge from Hitachi.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this service data and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Guidelines

1. Always unplug the instrument AC power cord from the AC power source before:
   a. Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
   b. Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
   Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc." The H.V. Distribution Box has an internal 400MΩ resistor (bleeder resistor) connected from the high voltage to ground. After power is removed from the instrument the high voltage will discharge through the high voltage bleeder resistor. If the tubes have high voltage after power is removed, then the bleeder resistor is defective or the bleeder ground is disconnected.
3. Discharge the picture tube's anode at any of the R, G, or B outputs on the High Voltage distribution box only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube high voltage distribution box R, G, or B output, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemical on or near this instrument or any of its assemblies.
5. Unless specified otherwise in these service data, clean electrical contacts by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator: 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength). **Caution:** This is a flammable mixture. Unless specified otherwise in these service data, lubrication of contacts is not required.
6. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service data might be equipped.
7. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
8. Always connect the test instrument ground lead to the appropriate instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.
9. Use with this instrument only the test fixtures specified in this service data.
   CAUTION: Do not connect the test fixture ground strap to any heatsink in this instrument.

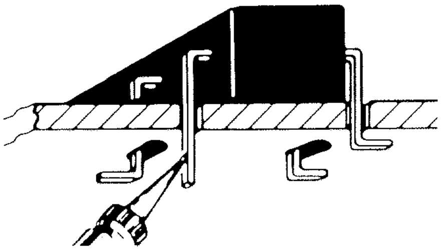
Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range 500°F to 600°F.
2. Use an appropriate gauge of resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique.
    a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
    b. Heat the component lead until the solder melts. Quickly draw away the melted solder with an anti-static, suction-type solder removal device or with solder braid.
    CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
    a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
    b. First, hold the soldering iron tip and solder strand against the component lead until the solder melts.
    c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
    CAUTION: Work quickly to avoid overheating the circuit board printed foil or components.
    d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.



Use Soldering Iron to Pry Leads

IC Removal/Replacement

Some Hitachi unitized chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas.)

"Small-signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact, then solder each connection.

Power Output Transistor Devices Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heatsink mounting screw (if so equipped).
3. Carefully remove the transistor from the circuit board.
4. Insert new transistor in circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicularly to the circuit board.
3. Observing diode polarity, wrap each lead out of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and, if necessary, apply additional solder.

Fuses and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of circuit board hollow stake.
2. Securely crimp leads of replacement component around stake 1/8 inch from top.
3. Solder the connections.

   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board, to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board, causing the foil to separate from, or "lift-off," the board. The following guidelines and procedures should be followed whenever this condition is encountered.

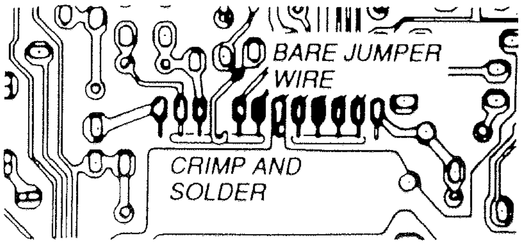
In Critical Copper Pattern Areas

High component/copper pattern density and/or special voltage/current characteristics make the spacing and integrity of copper pattern in some circuit board areas more critical than in others. The circuit foil in these areas is designated as Critical Copper Pattern and is identified and illustrated in this service data in the section titled Safety Related Copper Pattern (see data in the section titled Safety Related Copper Pattern (see table of contents for page number). Because Critical Copper Pattern requires special soldering techniques to ensure the maintenance of reliability and safety standards, contact your Hitachi personnel.

At IC Connections

To repair defective copper pattern at IC connections, use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections.)

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary.)
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.

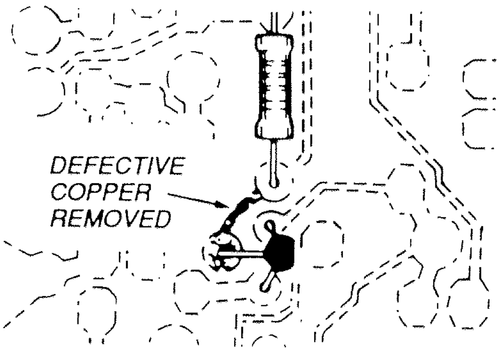


Install Jumper Wire and Solder

3. Bend a small "U" in one end of a small-gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the cut-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area, and clip off any excess jumper wire.

At Other connections

Use the following technique to repair defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.



Insulated Jumper Wire

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.

   CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

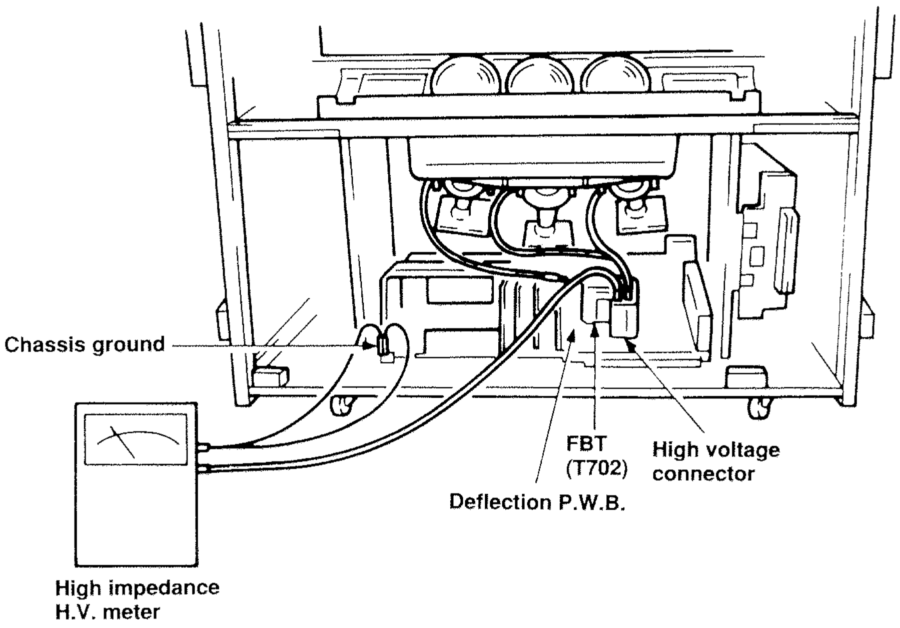
Frequency Synthesis (FS) Tuning Systems

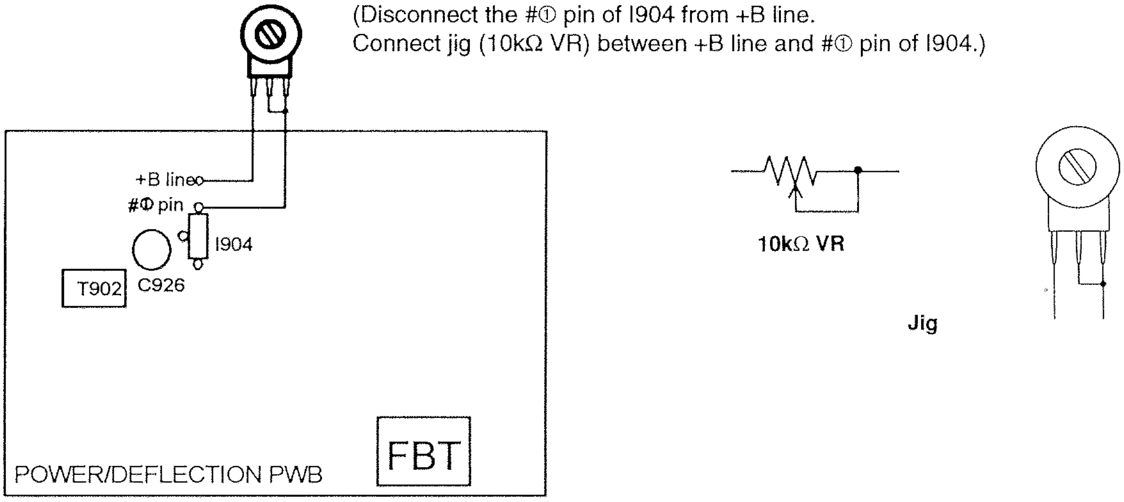
1. Always unplug the instrument AC power cord before disconnecting or reconnecting FS tuning system cables and before removing or inserting FS tuning system modules.
2. The FS tuner must never be disconnected from the FS tuning control module while power is applied to the instrument.
3. When troubleshooting intermittent problems that might be caused by defective cable connection(s) to the FS tuning system, remove the instrument AC power as soon as the defective connector is found and finish confirming the bad connection with a continuity test. This procedure will reduce the probability of electrical overstress of the FS system semi-conductor components.

TECHNICAL CAUTIONS

High Voltage limiter circuit operation check.

1. Turn off TV and connect jig as shown in Figure 2. Adjust jig fully counter-clockwise for minimum resistance.
2. Set the AC input to 120V AC and turn on TV.
3. Confirm test pattern on CRT is a usable picture, then slowly adjust jig until the picture disappears and TV shuts down.
4. When the limiter circuit is operating properly, High Voltage will be less than 35.5kV at 0.6mA when TV shuts down.
5. Turn off set immediately after checking circuit operation.
6. Unplug set for one minute to reset shutdown circuit. Remove jig and voltmeter.


Chassis ground
FBT
(T702)
High voltage
connector
Deflection P.W.B.
High impedance
H.V. meter


(Disconnect the #① pin of I904 from +B line.
Connect jig (10kΩ VR) between +B line and #① pin of I904.)

+B line
#① pin
I904
T902
C926
FBT
POWER/DEFLECTION PWB
10kΩ VR
Jig

Fig. 2 Deflection/Power Supply P.C.B.

SPECIFICATIONS

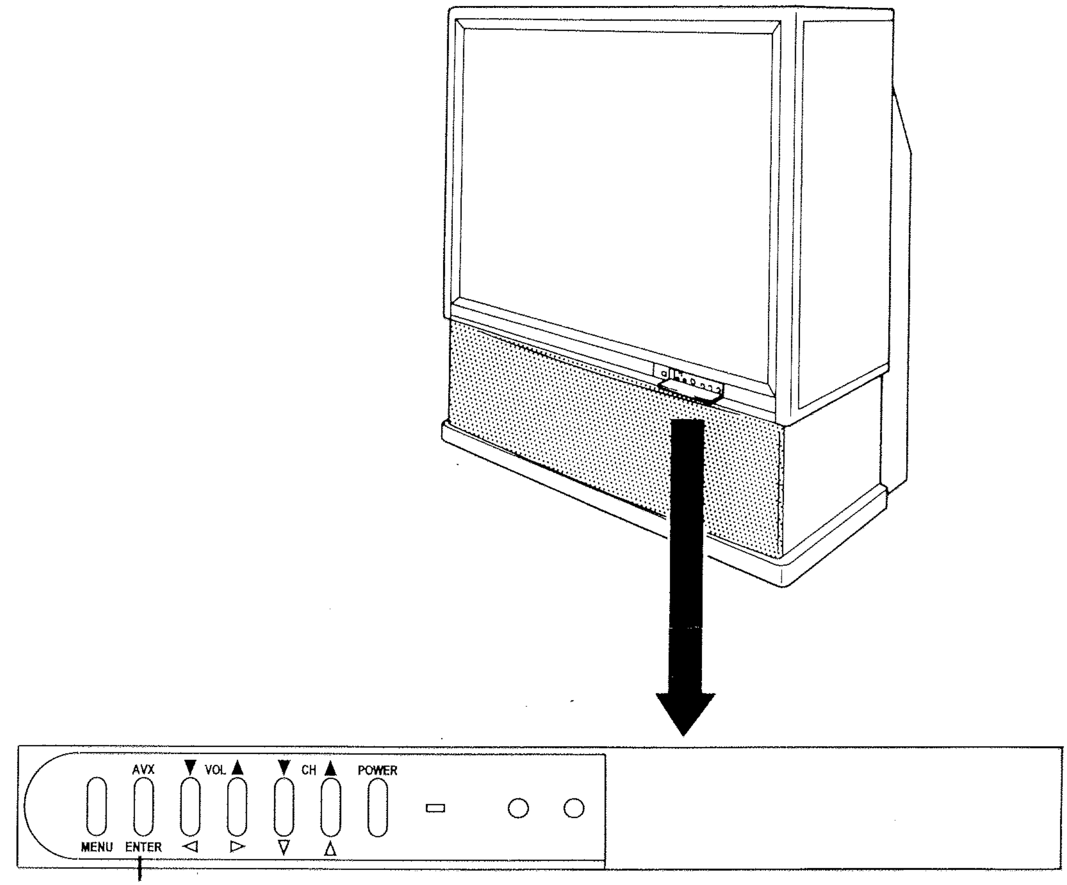
Model:	50EX14BV	55EX15K
Cathode-Ray Tube:	80° deflection 7 inch 180CSB22R(KU) 180CSB22G(KU) 180CSB22B(KU)	
Power Input:	120 volts AC, 60Hz	
Power Consumption:	210 watts - Maximum 154 watts - Operating	
Antenna Impedance:	75 ohm Unbalanced VHF/UHF/CATV	
Receiving Channel:		CH
	VHF	2-13
	EXT. Mid	(A-2)-(A-1),4+
	CATV Mid	A-I
	CATV Super	J-W
	CATV Hyper	(W+29)-(W+53)
Intermediate Frequency:	Picture I-F Carrier 45.75 MHz Sound I-F Carrier 41.25 MHz Color Sub Carrier 42.17 MHz	
Video Input:	1 Voltp-p 75 ohm	
Video Output:	1 Voltp-p 75 ohm	
Audio Input:	0.47 volt rms, 47 k ohm	
Stereo Audio Output:	0.47 volt rms, 1 k ohm	
Audio Output Power:	Front — 8 watts rms per channel, 8 ohm impedance. Rear — 4 watts per channel, 8 ohm impedance.	

Anode Voltage:	30.0 kV (Zero Beam Current)	
Brightness:	390 ft-Nominal - 50EX14BV 320 ft-Nominal - 55EX15K (Peak White)	
Speakers:	**50EX14BV**	**55EX15K**
	2 Woofers - 5 in. (12 cm) round	2 Woofers - 6 in. (16 cm) round
Dimension:	**50EX14BV**	**55EX15K**
Height (in.)	55-1/4	54-9/16
Width (in.)	41-5/8	45-9/16
Depth (in.)	28	26-11/16
Weight (lbs.)	251	210
Circuit Board Assemblies:	CPT (B) P.C.B. CPT (G) P.C.B. CPT (R) P.C.B. Signal P.C.B. Deflection/Power Supply P.C.B. Control P.C.B. Terminal P.C.B. V.M. P.C.B. Convergence Correction P.C.B. Speaker Terminal P.C.B.	

CIRCUIT PROTECTION

Fuse (or Device)	Circuit Protected	Physical Location
F902 5A/125V AC	Main Fuse	Power/Defl. Circuit Board
F903 5A/125V DC (MINIFUSE)	Main Fuse	Power/Defl. Circuit Board
F905 4A/125V DC (MINIFUSE)	26V Supply (Audio)	Power/Defl. Circuit Board
F906 1.6A/125V DC	115V (+B) Supply	Power/Defl. Circuit Board

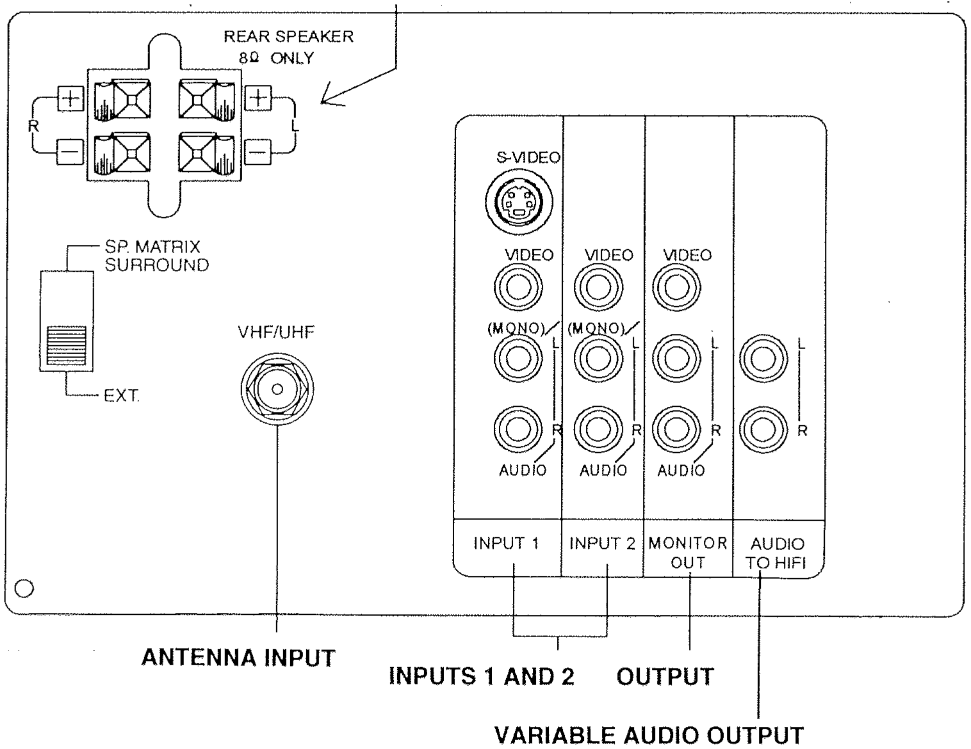
GENERAL INFORMATION


AVX
VOL
CH
POWER
MENU
ENTER

TV/VIDEO SOURCE SELECTOR

Control Panel
Fig. 3

REAR SPEAKER TERMINALS


REAR SPEAKER
8Ω ONLY
R
L
SP. MATRIX
SURROUND
EXT.
VHF/UHF
S-VIDEO
VIDEO
VIDEO
VIDEO
(MONO)/
(MONO)/
L
L
L
L
R
R
R
R
AUDIO
AUDIO
AUDIO
INPUT 1
INPUT 2
MONITOR OUT
AUDIO TO HIFI

ANTENNA INPUT

INPUTS 1 AND 2

OUTPUT

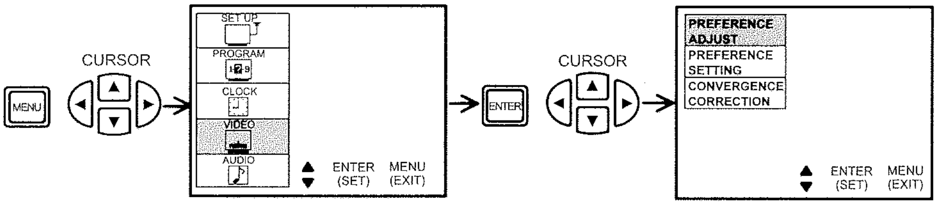
VARIABLE AUDIO OUTPUT

Rear Connections Panel
Fig. 4

ADJUSTING FOR PICTURE AND SOUND FUNCTIONS

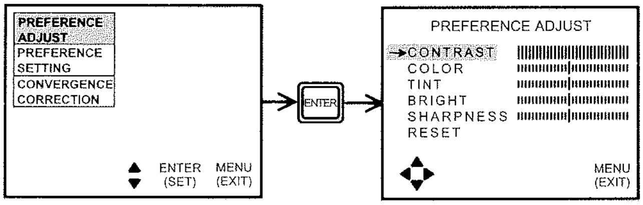
VIDEO

Select VIDEO to adjust picture settings, improve picture quality, and to adjust convergence.


MENU
CURSOR
SET UP
PROGRAM
CLOCK
VIDEO
AUDIO
ENTER (SET)
MENU (EXIT)
ENTER
CURSOR
PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE CORRECTION
ENTER (SET)
MENU (EXIT)

PREFERENCE ADJUST

Use this feature to adjust contrast, color, tint, brightness, and sharpness.

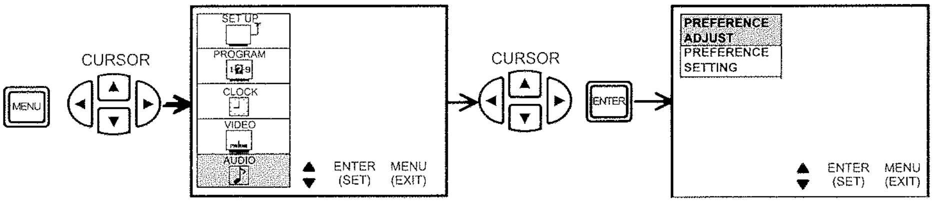

PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE CORRECTION
ENTER (SET)
MENU (EXIT)
ENTER
PREFERENCE ADJUST
CONTRAST
COLOR
TINT
BRIGHT
SHARPNESS
RESET
MENU (EXIT)

Press the CURSOR buttons to select and make adjustments.
The function to be adjusted will be in yellow.

CONTRAST —	Use this function to change the contrast between black and white level in the picture. This adjustment will only affect the picture when the PICTURE SETTING AI is OFF.
COLOR —	Use this function to adjust the level of color in the picture.
TINT —	Use this function to adjust flesh tones so they appear natural.
BRIGHT —	Use this function to adjust overall picture brightness.
SHARPNESS —	Use this function to adjust the amount of fine detail in the picture.
RESET —	When RESET is selected, press ENTER to return video adjustments to factory preset conditions.

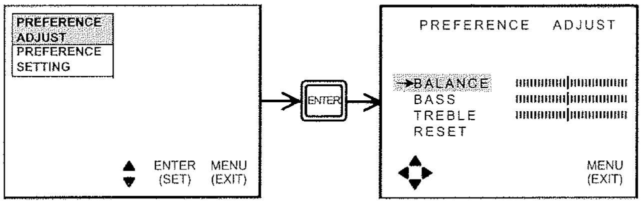
AUDIO

Select AUDIO to adjust the TV to your preference, to improve the sound quality, and to select special sound effects.


MENU
CURSOR
SET UP
PROGRAM
CLOCK
VIDEO
AUDIO
ENTER (SET)
MENU (EXIT)
CURSOR
ENTER
PREFERENCE ADJUST
PREFERENCE SETTING
ENTER (SET)
MENU (EXIT)

PREFERENCE ADJUSTMENT

Use this to set balance, bass, and treble.


PREFERENCE ADJUST
PREFERENCE SETTING
ENTER (SET)
MENU (EXIT)
ENTER
PREFERENCE ADJUST
BALANCE
BASS
TREBLE
RESET
MENU (EXIT)

Press the CURSOR buttons to select and make adjustments.
The function to be adjusted will be in yellow.

BALANCE — This function will control the left to right balance of the TV internal speakers, the AUDIO TO HI-FI output, and the Surround speakers.

BASS — This function controls the low frequency audio to all speakers.

TREBLE — This function controls the high frequency audio to all speakers.

RESET — When RESET is selected, press ENTER to return audio adjustments to factory preset conditions.

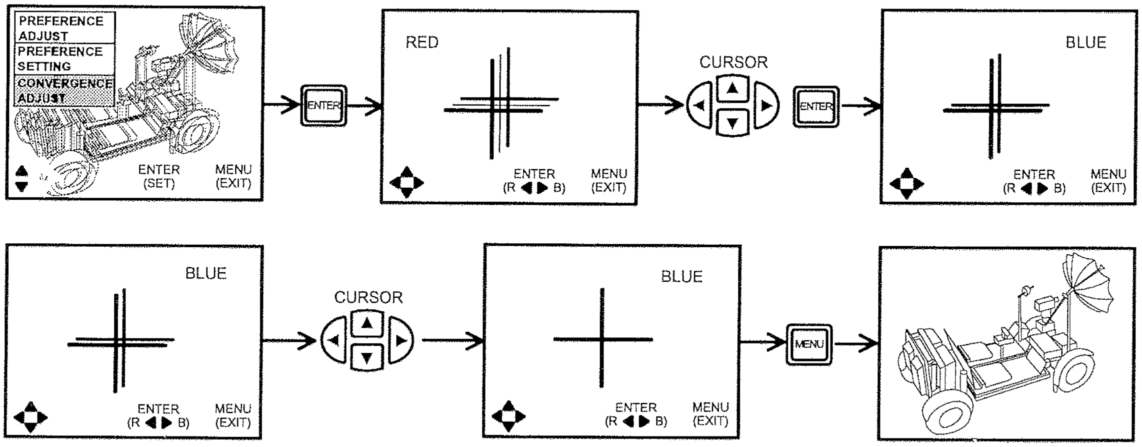
SELF CHECK REPAIR CODES

Press the AVX and POWER buttons on the control panel at the same time.

CODE	DETECTION CONTENTS	DETECTION TIME	REMARK
40	Abnormal deflection circuit	- - -	- - -
41	Abnormal + B line	- - -	- - -
42	Abnormal convergence circuit	- - -	- - -
10	Check for PLL lock	Not locked in 2 sec.	During selection time
11	Check for AFC operation	Not finished in 2 sec.	During selection time
60	Check for AC input	At uP reset time	AC input (50/60Hz) not detected at reset time
31	Check I001 operation	At uP reset time	Check for out of range operation
43	Abnormal signal circuit	- - -	- - -

Note: Code 10 or 11 may appear if TV is turned on without an antenna source connected.

CONVERGENCE ADJUST


PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE ADJUST
ENTER (SET)
MENU (EXIT)
ENTER
RED
ENTER (R ◀ ▶ B)
MENU (EXIT)
CURSOR
ENTER
BLUE
ENTER (R ◀ ▶ B)
MENU (EXIT)
BLUE
ENTER (R ◀ ▶ B)
MENU (EXIT)
CURSOR
BLUE
ENTER (R ◀ ▶ B)
MENU (EXIT)
MENU

Press the CURSOR ▲, ▼ to move the color displayed up or down.
Press the CURSOR ◀, ▶ to move the color displayed left or right.
Press ENTER to change the color.
Press MENU to exit.

CAUTIONS WHEN CONNECTING/DISCONNECTING THE HV CONNECTOR

Perform the following when the HV connector (anode connector) is removed or inserted for CPT replacement, etc.

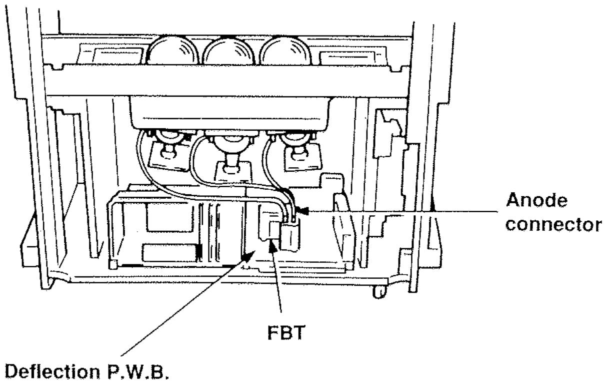

Anode connector
FBT
Deflection P.W.B.

Fig. 5

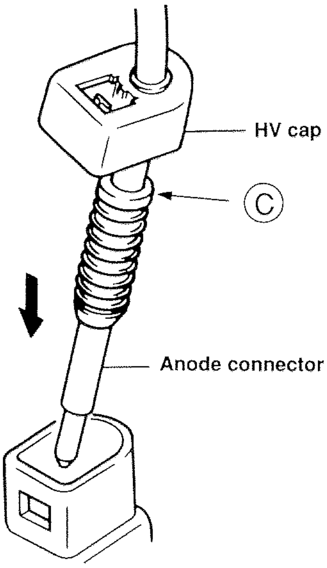

HV cap
Ⓒ
Anode connector

Fig. 7

During Removal

1. Insert a small flat-bladed screwdriver (adjustment screwdriver: 5-7 mm wide and 0.2-0.3 mm thick) into section Ⓐ in Fig. 6 and then push it in the direction of arrow Ⓑ. The lock will release with a click. (The state in Fig. 8 (1) will change to that in Fig. 8 (2).)

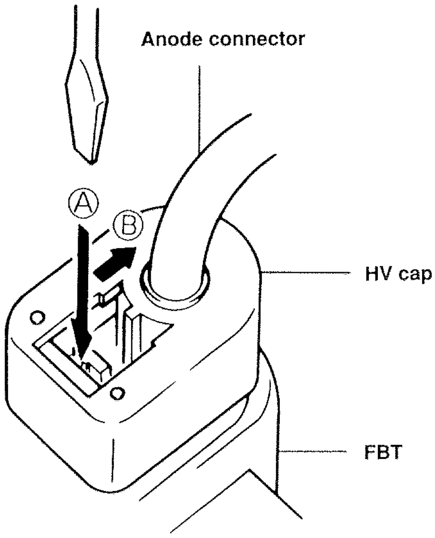
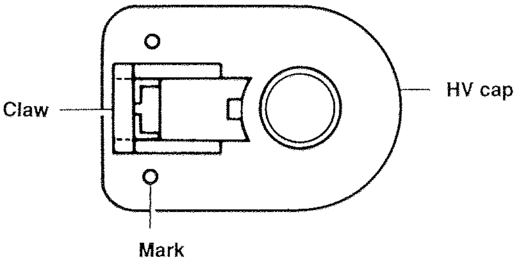

Anode connector
Ⓐ
Ⓑ
HV cap
FBT

Fig. 6

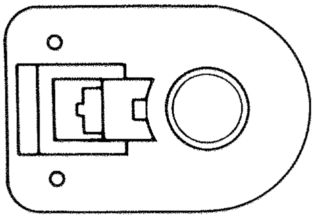
2. Remove the HV cap and remove the anode connector (Fig. 7).

During Insertion

1. Insert the anode connector deep into the FBT (to section Ⓒ in Fig. 7) and then push the HV cap into the FBT until it clicks.
2. Make sure the connector is securely inserted. (Check that the claw is at the mark on the HV cap shown as in Fig. 8 (1).)


Claw
HV cap
Mark

(1) Lock on
(When connector is inserted)



(2) Release
(When connector is removed)

Fig. 8

ADJUSTMENT INSTRUCTION

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1. ASSEMBLED P.W.B. ADJUSTMENT (Surround P.W.B.)

Note: This adjustment is only necessary when replacing the Surround P.W.B. Do not press INITIAL SET for an existing Surround P.W.B. or adjustment data will be lost. (Do not press ENTER)

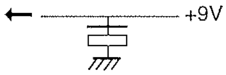
Preparation for adjustment

MTS demodulating circuit adjustment

(1) Press the "POWER" button while pressing the "VOL DOWN" button to select "MTS ADJ" mode as shown.

MTS ADJUST	
→ INITIAL SET	:
INPUT LEVEL	: 20
ST VCO	: 20
FILTER	: 3F
SEPARATION (L)	: 20
SEPARATION (H)	: 20
SAP VCO	: 20

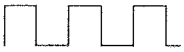
(2) Select the "INITIAL SET" to set each adjust data to initial data.
(3) Apply +9±0. 1V to the point as shown below.
  (1) SU1 connector ⑲ pin (MAXUS)
  (2) FRONTEND (U001) +B
  (3) SU 2 connector ⑭ pin GND



1.1 ST VCO adjustment

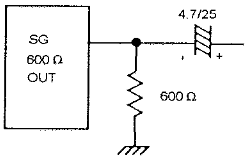
Adjustment preparation
(1) Select the "ST VCO" on "MTS ADJ" model
(2) Connect a frequency counter to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).
Note: Use 1:1 probe
Probe standard Ri≥1MΩ, Ci≤15pF
(3) Input of SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) is no signal.

Adjustment procedure
(1) Adjust the data Set to 15. 734±0. 1kHz of a frequency counter.
Note: Variable range of data: 00~3F (HEX).
Wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).



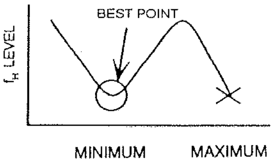
1.2 Filter adjustment

Adjustment preparation
(1) Select the "FILTER" on "MST ADJ" mode.
(2) Apply the signal to SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) with the jig shown.



SU1 connector ⑩ pin
(IW01 ⑦ pin AUDIO-IN)

f=15. 734kHz (Sin wave)
v=100mVrms



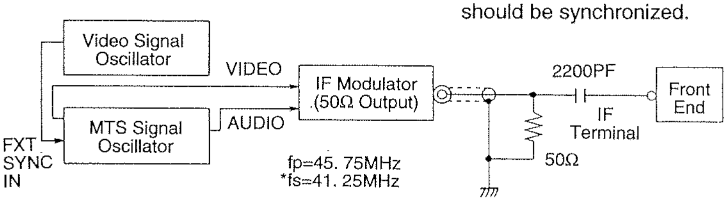
(3) Connect an oscilloscope to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT)

Adjustment procedure
(1) Adjust the data so that the wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT) is minimum as shown above.
Note: Variable range of data: 00~3F (HEX)

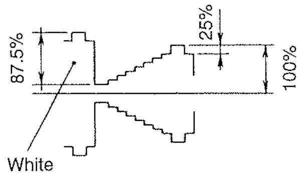
1.3 Input level adjustment

Adjustment preparation
(1) Select the "INPUT LEVEL" on "MTS ADJ" mode.
(2) Apply the signal to F/E IF input terminals of SIGNAL PWB using the jig shown.

Using the jig
*Video signal and audio signal should be synchronized.



IF modulator output signal waveform (Color bar or all white)



IF modulator output level and P/S
P=106dBu (50 ohm termination)
S level: -3dB to p
At this time, S/N ratio of F/E video output is 45dB or less.

Sound Modulation Condition
•Noise reduction encoder : ON
•Stereo signal : ① R=0 (L only), 300Hz, 30% modulation (note)
: ② R=0 (L only), 3KHz, 30% modulation (note)
•Monaural signal : ③ Monaural, 400Hz, 100% modulation (PRE-EN OFF)
•SAP signal : ④ SAP, 300Hz, 30% modulation (note)

Note 1: Use sound modulator with frequency characteristics within +1% during 50Hz~100KHz.
Note 2: Turn off noise reduction (NR), set 30% modulation, then turn (NR) on. Set modulation at audio signal generator output, not IF modulator output.

(3) Connect AC voltmeter to SU1 connector⑦ pin (IW01 ㉖ pin R-OUT)

Adjustment procedure
(1) Select sound input signal 3 and adjust the data set to 500±10mVrms of Vo.
Note: Variable range of data: 00~3F (HEX)

1.4 Separation adjustment

Adjustment preparation
(1) Connect an oscilloscope to SU1 connector (IW01 ㉖ pin R-OUT)
(2) Same as in item 1.3 (2).
(3) Set "MTS" to "STEREO".

Adjustment procedure
(1) Select the "SEPARATION (L)" on "MTS ADJ" mode.
(2) Select sound input signal ① and adjust the data so that 300Hz level is min.
Note: Variable range of data: 00~3F (HEX)
(3) Select the "SEPARATION (H)" ON "MTS ADJ" mode.
(4) Select sound input signal ② and adjust the data so that 3kHz level is min.
Note: Variable range of data: 00~3F (HEX)
(5) Repeat (1) and (4).
Note: •Adjustment precision: within + 1dB from min. point.
•"STEREO" should be displayed on the screen.
•Readjust INPUT LEVEL (1.3) as required.

1.5 SAP VCO adjustment

Adjustment preparation

(1) Select the "SAP VCO" mode.
(2) Connect a frequency counter to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).

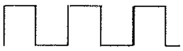
Note: •Use probe 1:1.
•Probe standard Ri≥1MΩ, Ci≤15pF.

(3) Input of SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) is no signal.

Adjustment procedure

(1) Adjust the data set to read 78.67 ±0.5kHz on frequency counter.

Note: •Variable range of data: 00~3F (HEX)
•Wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-out).



1.6 SAP reception check

Adjustment preparation

(1) Same as in item 1.3 (2).
(2) Connect an oscilloscope to SU1 connector (IW01 ㉖ pin R-OUT).
(3) Set "MTS" to "SAP".

Adjustment procedure

(1) Select the audio input signal ①. The output level at this time is represented by VST.
(2) Select the audio input signal ④. Check that the output level at this time is almost the same as VST. ("SAP" should be displayed at this time.)

2. CHASSIS ASSEMBLY ADJUSTMENT (SIGNAL BLOCK)

2.1 Memory initialization

Adjustment preparation

(1) Refer to section 4. ADJUSTMENT POINT to locate the 2-pin PI2 connector, on the signal PWB.

Adjustment procedure

(1) Short the pins for one second, then remove.
(2) A short "beep" will be heard at reset time, and channel "03" will be displayed on the OSD.

Note: The TV will be set to factory shipping conditions. Do not unplug set or press any buttons during this operation.

2.2 Comb filter adjustment

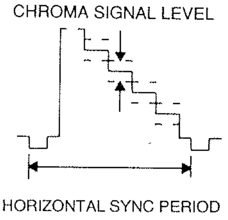
Adjustment preparation

(1) Receive the color bar signal at the regular tuning point.
(2) Connect the oscilloscope to the emitter of Q312.
(3) Set the brightness to Max (+31) and set the other controls to typ (0).
(4) Set the AI to OFF.

Adjustment procedure

(1) Check that the residual signal level is 50mVp-p or less.

Note: The chrome signal level is the point shown below.



Note: •Use a 10:1 probe.
•Use an oscilloscope with a 20mV/div resolution.

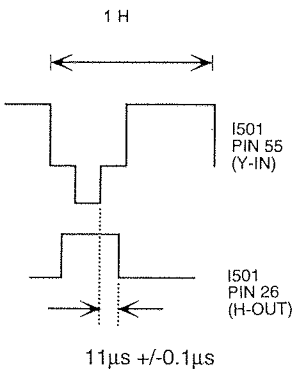
2.3 Horizontal coarse AFC adjustment (R367)

Adjustment preparation

(1) Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
(2) Connect the oscilloscope to I501 pin (55) (Y-in) and pin ㉖ (Horizontal pulse out).

Adjustment procedure

(1) Adjust R367 (AFC) for 11µs delay between pin (55) and ㉖.



3. FINAL ASSEMBLY ADJUSTMENT

3.1 Optical system adjustment

3.1.1. Focus adjustment

Adjustment preparation

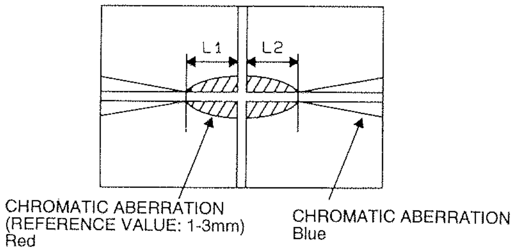
(1) The set can face in any direction, west, east, north or south.
(2) Receive the cross-hatch pattern signal.
CONTRAST: CENTER
BRIGHTNESS: -16 (-8 position shown on the display)
(3) The electrical focus adjustment should have been completed.
(4) The centering DY inclination should have been adjusted.

Adjustment procedure

(1) Loosen the fixing screw on the lens cylinder so that the lens cylinder can be turned. (Be careful not to loosen too much. If it is loosened too much, rattling when tightening becomes greater and the focus may drift.) After completing steps (5), (6) and (7) below, tighten the fixing screws for each lens with a torque of 12-17kg/cm.
(2) Apply covers to 2 of R, G and B lenses, and project a single color on the screen and adjust in sequence. (The adjustment order of R, G and B is only an example.)
(3) For each of the R, G and B lenses, observe the color aberration generated on the outer circumference of the cross-hatch bright line at the center section ± 3 pitches vertically and horizontally from the center.
(4) If the lens adjustment knob is turned clockwise, viewed from the front, the color aberration changes as follows.

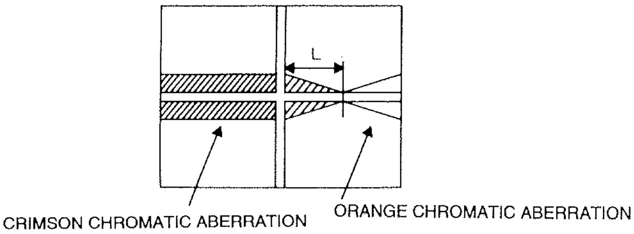
Lens	Change of color aberration
R lens	Orange → Crimson
G lens	Blue → Red
B lens	Purple → Green

(5) In case of G lens, set to the point where the chromatic aberration switches from blue to red. If the chromatic aberration appearing all over the screen is not the same, observe the horizontal bright line at the center of the screen and set to the position where red chromatic aberration slightly appears (reference value: 1-3mm) within the cross-hatch pitches specified in Table below. When the red chromatic aberration appearing at both sides of the bright line is not equal, observe the side with larger chromatic aberration when adjusting.



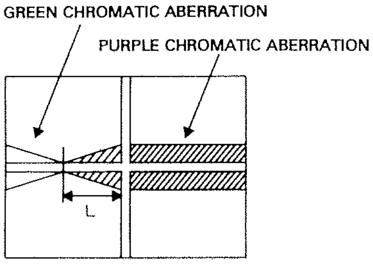
Set Size	Pitch between L1 & L2
50"	4.0 cross-hatch pitches
55"	4.0 cross-hatch pitches

(6) In case of R lens, set to the position where the chromatic aberration changes from orange to crimson.
As shown below, observe the horizontal bright line at the center and set to the position where the crimson chromatic aberration slightly appears (reference value: 1-3mm) within the cross-hatch pitches specified in Table below. Change the signal and fine-adjust in the same way as the G lens.

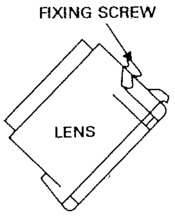


Set Size	Pitch between L
50"	4.0 cross-hatch pitches
55"	4.0 cross-hatch pitches

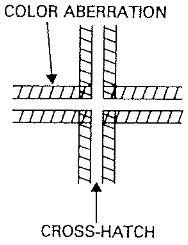
(7) In case of B lens, set to the position where the chromatic aberration changes from purple to green.



Notes: (1) Fixing screw



(2) Color aberration



(3) Since the G light is very important for picture quality and performance, pay special attention in its adjustment.
Note: Be careful not to touch the lens with your fingers when adjusting.
(4) For red, setting to the center between orange and crimson is optimum.
(5) For blue, setting to the center between purple and green is optimum.

3.2 Signal system adjustment

3.2.1. White balance adjustment

(1) Screen adjustment
(2) High brightness white balance
(3) Low brightness white balance

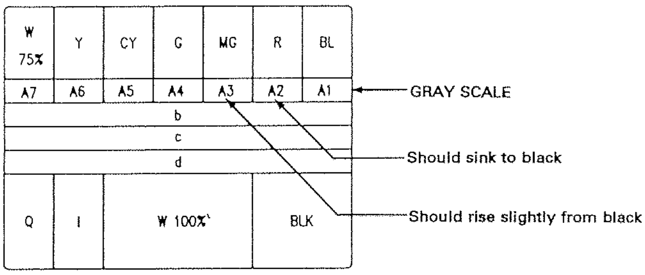
Screen adjustment VRs	Drive adjustment VRs
Red: R804R	Red: R874
Green: R804G	Green: R843
Blue: R804B	

Adjustment preparation
(1) Start adjustment 20 minutes or more after the power is turned on.
(2) The vertical incident illumination on the screen should be 20 lux or less.
(3) Receive the white raster.
(4) Set the drive adjustment VRs (red and green) to their mechanical centers.
(5) Turn the screen adjustment VRs (red, green, blue) fully counter-clockwise.
(6) Set video preference setting white control to warm position.
(7) Set the S301 switch to the front as viewed from the front of the signal P.W.B. (Set to SERVICE side.)

Adjustment procedure
(1) Gradually turn the screen adjustment VRs (red, green, blue) clockwise and set them where the red, green and blue slightly bright lines just appear evenly on the screen.
(2) Return S301 to the NORMAL side.
(3) Set the brightness and black level controls to minimum and turn the sub brightness adjustment VR (R325) and set so that the white raster can be seen slightly.
(4) Set the brightness and black level controls to maximum.
(5) Adjust the high brightness white balance using the drive adjustment VRs (red, green).
(6) Set the brightness to 3ft-L amount or less using the brightness and black level controls.
(7) Adjust the low brightness white balance using the screen adjustment VRs (red, green, blue). (Visually adjust.)
(8) Check that high brightness white balance is obtained.
If it does not, return to step (5).
Note: When adjusting the white balance, if the horizontal single raster is to be obtained using S301, check that the screen adjustment VRs are turned fully counterclockwise. Since the phosphorescent surface of the CRT is likely to be burnt, be careful.
White balance: 7500ºK+0MPCD
Color coordinate: X.....0.301
Y.....0.310

3.2.2. Sub brightness adjustment (R325)

Adjustment preparation
(1) Start adjustment 20 minutes or more after the power is turned on. Receive the color bar signal.
(2) Set the contrast and color controls to minimum.
(3) Set the brightness to -6 (-3 position shown on the display).
(4) The vertical incident illumination on the screen should be 20 lux or less.



Adjustment procedure
(1) Adjust so that the points A1 and A2 sink to black and A3 slightly above it rises using the sub brightness adjustment VR (R325).
Note: Directly observe the screen by eye without using a mirror.

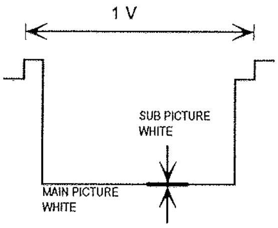
3.2.3. Sub picture adjustment (R506-B, R505-G, R502-R)

Adjustment preparation

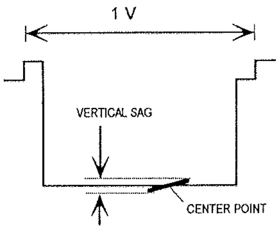
1. Start adjustment after power is on for 20 minutes.
2. Use a white raster signal for adjustment.
3. Press "FREEZE" on the remote control to display the sub picture.
4. Set contrast to center, brightness minimum, AI off.

Adjustment procedure

1. Connect oscilloscope to TP802B and adjust R506 to match blue level of main and sub pictures.
2. Repeat for TP802G and R505 green, TP802R and R502 for red.



Note: If the sub picture has a signal sag, adjust level at center point.



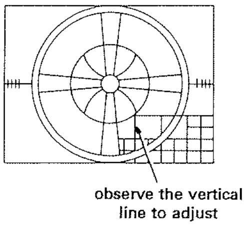
3.2.4. Shoot balance adjustment (R333)

Adjustment preparation

1. Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
2. Set the video condition to factory reset.
3. Turn the shoot balance adjustment VR (R333) fully counter-clockwise.

Adjustment procedure

1. Gradually turn the shoot balance adjustment VR (R333) clockwise and adjust so that the width of pre-shoot and over-shoot of the vertical line (black) shown in the circle pattern are balanced. (Visually adjust.)



Note: Directly observe the screen by eye without using a mirror.

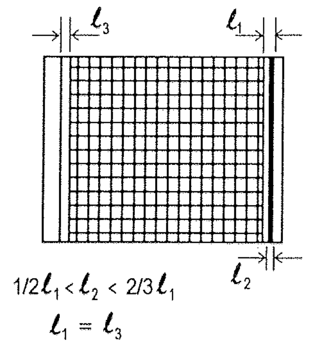
3.2.5. Horizontal AFC adjustment (R367)

Adjustment preparation

1. Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
2. Set CONTRAST to maximum BRIGHTNESS to center.
3. Lens focus should be completed.
4. Electrical focus should be coarse adjusted.
5. Dynamic convergence should be coarse adjusted.
6. Raster inclination should be completed.

Adjustment procedure

1. Project only green color. Cover R & B lenses or short 2P mini connectors on CPT P.W.B.'s.
2. Adjust H-size to minimum. RUL9 fully counterclockwise.
3. Adjust green centering magnet (located on DY) to shift picture left to display edge of raster.
4. Adjust AFC (R367) so foldover of front porch occurs. Amount of foldover is 1/2 to 2/3 of front porch (ℓ_1).



Note: (1) If raster edge cannot be seen, adjust GH-Pin (RUG9) fully counterclockwise and GH-L-Pin (RUG5) to its mechanical center.
(2) Front and back porch of video should be equal.
(3) If adjustment is difficult with test pattern, follow adjustment 2.3.

3.3.DEFLECTION SYSTEM ADJUSTMENT

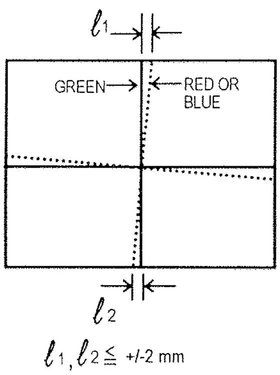
3.3.1. Raster inclination adjustment (Deflection yoke)

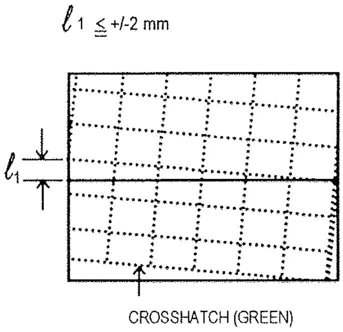
Adjustment preparation

1. The set can face east or west.
2. Input the single cross test signal.
3. CONTRAST: MAX
   BRIGHTNESS: CENTER
4. The lens focus adjustment should have been completed.
5. The electric focus should have been coarse adjusted.
6. The dynamic convergence should have been coarse adjusted. Set the RH-Skew (RU82), BH-Skew (RUE3), RV-Skew (RU25), BV-Skew (RU53), GV-Center (RUN5), GH-Center (RUN9), BV-Center (RUP4), BH-Center (RUP8), RV-Center (RUQ3), and RH-Center (RUQ7) adjustment VRs to their mechanical centers.
7. Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure

1. Apply covers to the R and B lenses and project only green light.
2. Turn the G deflection yoke and adjust the vertical raster inclination.
3. Then, remove the cover of R or B lens and project red or blue light and green light together on the screen.
4. Turn the deflection yoke of R or B and set so that the inclination of R or B with respect to the green light is as shown below on the top and bottom sides.
5. After raster inclination adjustment, fixing screw of DY should be screwed with 12±2 kg•cm torque.





3.3.2. Raster position adjustment

Adjustment preparation

(1) The same as item 3.3.1. (1)~(7).
(2) The raster inclination adjustment should have been completed.
(3) Horizontal AFC adjustment should have been completed.
(4) Apply marking using the tape, etc. at the positions on the screen as shown in Fig. 3-3-2.

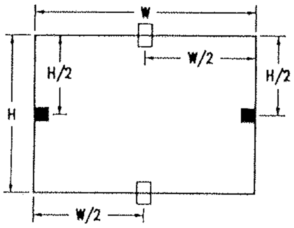


Fig. 3-3-2.

Adjustment procedure

(1) Apply covers to the R lens and B lens, and project only green light on the screen.
(2) Use the green centering magnet and adjust so that the vertical and horizontal lines of the cross pattern match the position where the markings have been applied.
(3) Then remove the cover of R lens or B lens, and project the red or blue light and green light on the screen.
(4) Turn the R or B centering magnet to match the color with the green light.

Note: (1) Spec for green centering vertical direction ±3mm horizontal direction ±2.5mm.
(2) Center of test pattern with respect to geometrical center of screen:
horizontal within 30mm, vertical within 20mm
(3) Red and Blue centering with respect to green is ±2mm in both horizontal and vertical directions.

3.3.3. Pincushion distortion and keystone distortion correction

Adjustment preparation

(1) The screen can face any direction, north, south, east and west.
(2) Display the cross-hatch pattern signal.
(3) The focus adjustment of the G lens should have been completed.
(4) The G raster (deflection yoke) inclination should have been adjusted.
(5) The vertical amplitude and horizontal amplitude should have been coarse adjusted.
(6) Set the GV-Center (RUN5) and GH-Center (RUN9) adjustment VRs to their mechanical centers.

Adjustment procedure

(1) Project only G on the screen using any one of following procedures.
    a. Apply covers to the R and B lenses.
    b. Short-circuit 2P sub mini connectors plug pins of the R and B CPT P.W.B.
(2) Adjust the horizontal line of the G according to the procedure shown in Table 3-1.
(3) Adjust the vertical line of the G according to the procedure shown in Table 3-2.

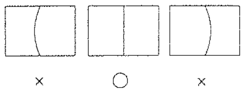
Note: (1) The positions of the adjustment VRs are shown in Fig. 3-4-4. The movement of the bright line corresponding to each VR is shown in Fig. 3-4-3.
(2) After this adjustment, check the raster position, vertical amplitude and horizontal amplitude of the G and adjust finally.

Table 3-1. The pincushion and keystone distortion correction of the horizontal green line (refer to Figs. 3-4-3 and 3-4-4).

No.	Adjustment Item		Adj. VR	Adjustment Details
1	Lower horizontal line	Upper/lower pincushion distortion GV-PIN	RUF2	Correct the bow distortion of the lower horizontal line and make it a straight line.
2		Upper/lower keystone distortion GV-KEY	RUG1	Remove the inclination of the lower horizontal line.
3	Upper horizontal line	Upper pincushion distortion GV-U-PIN	RUE7	Correct the bow distortion of the upper horizontal line and make it a straight line.
4		Upper keystone distortion GV-U-KEY	RUF6	Remove the inclination of the upper horizontal line.

Note 1. Adjustment procedure of the horizontal line (1) Lower line (RUF2/RUG1) and then (2) Upper line (RUE7/RUF6).
Note 2. Adjust repeatedly as occasion demands.

Table 3-2. The pincushion and keystone distortion correction of the vertical green line (refer to Figs. 3-4-3 and 3-4-4).

No.	Adjustment Item		Adj. VR	Adjustment Details
1	Center vertical line	Left/right pincushion distortion phase GV-PIN-PHASE	RT26	(1) Approximately correct the bow distortion at both the left and right sides using GH-PIN (RUG9) and GH-L-PIN (RUG5). (2) Turn RT26 to correct the bow distortion of the center vertical line and to make it a straight line. 
2	Right vertical line	Left/right pincushion distortion GH-PIN	RUG9	Correct the bow distortion of the right side vertical line and make it a straight line.
3		Left/right keystone distortion GH-KEY	RUH8	Remove the inclination of the vertical line on the right side.
4	Left side vertical line	Left pincushion distortion GH-L-PIN	RUG5	Correct the bow distortion of the left side vertical line and make it a straight line.
5		Left keystone distortion GH-L-KEY	RUH4	Remove the inclination of the vertical line on the left side.

Note 1. Adjustment procedure of the vertical line (1) Phase (RT26), (2) Lines on right (RUG9/RUH8), and then left side (RUG5/RUH4).
Note 2. Adjust repeatedly as occasion demands.

3.3.4 Size adjustment

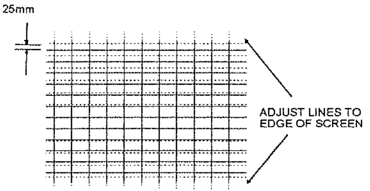
3.3.4.1. Vertical amplitude adjustment (RUN3)

Adjustment preparation

(1) Start adjustment more than 20 minutes after the power is turned on.
(2) The pincushion distortion and the keystone distortion adjustment should have been completed.
(3) Receive the crosshatch signal.
(4) Set the contrast control to maximum and brightness control to center.
(5) Apply cover to the R and B lenses or short-circuit the 2P sub-mini plug pins on the R and B CPT P.W.B. and project only Green on the screen.
(6) Set the GV-Center (RUN5) and GH-Center (RUN9) adjustment VRs to their mechanical center.

Adjustment procedure

(1) Adjust RUN3 so that top and bottom edge of crosshatch touch top and bottom edge of screen frame.
(2) Note the position of the first horizontal crosshatch line.
(3) Increase V size so that the horizontal line moves up 25mm.



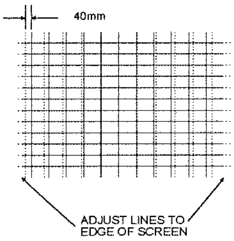
3.3.4.2. Horizontal amplitude adjustment (RUL9)

Adjustment preparation

(1) The same as items 3-3-4-1 (1)-(6).

Adjustment procedure

(1) Adjust RUL9 so that left and right edge of crosshatch touch left and right edge of screen frame.
(2) Note position of first vertical crosshatch line.
(3) Increase H size (RUL9) so that the vertical line moves to the left 40mm.



3.3.5 Focus adjustment

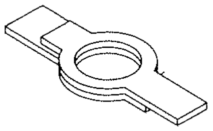
3.3.5.1. Beam alignment

Adjustment preparation

(1) Adjust at least 30 minutes after turning on power switch.
(2) The static convergence data should be cleared (see section 2.1 Memory initialization).
(3) Raster inclination, centering, horizontal and vertical amplitudes and optical focus adjustment should be completed.
(4) Contrast: Max.
Other items: Typ.
(5) Receive cross-hatch signals. (Use of internal cross-hatch signals allowed.)
(6) Short-circuit all metal parts (metal fittings, centering magnet) installed on the projection tubes to GNDs of the projection tubes.
Since metal parts are charged with electricity, shocks may be caused if they are not short-circuited.

Adjustment procedure

(1) Green (G) tube beam alignment adjustment. Short-circuit 2P subminiature connector plug pins of Red (R) and Blue (B) on the CPT boards and project only Green (G) tube.
(2) Put Green (G) tube beam alignment magnet to the cancel state as shown below.



(3) Turn the Green (G) static focus (Focus Pack) counterclockwise all the way and make sure of position of cross-hatch center on screen. (Halo state.)
(4) Turn Green (G) static focus (Focus Pack) clockwise all the way. (Blooming state.)
(5) Turn two magnets forming alignment magnet in any desired direction and move cross-hatch center to position found in (3).
(6) If image position does not shift when Green (G) static focus (Focus Pack) is turned, Green (G) beam alignment has been completed.
(7) If image position shifts when Green (G) statis focus (Focus Pack) is turned, repeat (2)-(6).
(8) Conduct beam alignment for Red (R) focus: Focus Pack EFPK Blue (B) focus: Focus Pack EFPK
(9) Upon completion of adjustment, fix beam alignment magnets with white paint.

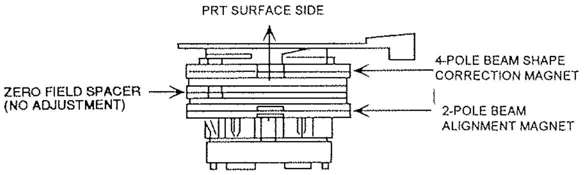
3.3.5.2. Beam shape adjustment

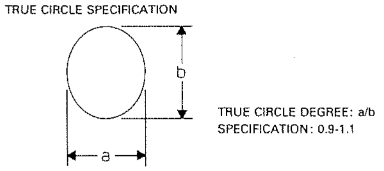
Adjustment preparation

(1) The beam alignment should have been completed.
(2) The raster inclination, centering, horizontal/vertical amplitude and optical focus adjustments should have been completed.
(3) Contrast: Max
Other time: Typ.
(4) Input the dot signal.

Adjustment procedure

(1) Green PRT beam shape adjustment. Short-circuit 2P submini connectors on Red and Blue CPT P.W.B.s to project only the Green beam.
(2) Turn the green static focus fully clockwise. (Blooming.)
(3) Make the dot at the screen center a true circle using the 4-pole magnet as shown below.
(4) Also adjust the Red and Blue PRT beam shapes according to the steps (1) to (3).
(5) After the adjustment is completed, return R, G and B static VRs to the Just focus point.


PRT SURFACE SIDE
4-POLE BEAM SHAPE CORRECTION MAGNET
ZERO FIELD SPACER (NO ADJUSTMENT)
2-POLE BEAM ALIGNMENT MAGNET



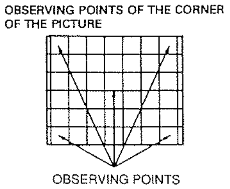
3.3.5.3. Static focus adjustment

Adjustment preparation

(1) The raster inclination, centering, horizontal/vertical amplitude and optical/electrical focus beam alignment should have been adjusted.
(2) The static convergence data should be cleared.
(3) Contrast: More than MAX-5 STEP
Brightness: Center (Reset point)
(4) Receive the cross-hatch pattern signal.
(5) Apply covers to the lenses of colors other than the color to be adjusted and project a single color.

Adjustment procedure

(1) Red (R), Green (G) and Blue (B) static focus adjustment. Vary the static focus VR (focus pack EFPK) and make the center of the cross-hatch pattern clearest.
(2) Observe the corners of the picture and check that the focus does not get conspicuously worse.



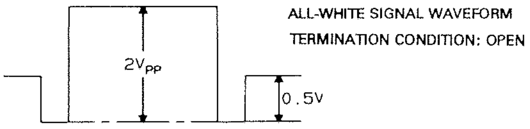
3.3.6. Blue defocus adjustment

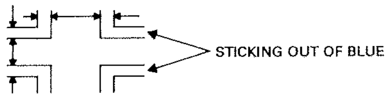
Adjustment preparation

1. Optical and electrical focus adjustment should have been completed.
2. The convergence adjustment should have been completed. Coarse-adjustment is acceptable for convergence.
3. Brightness: Max.
   Other items: Typ.

Adjustment procedure

1. Input an all-white signal shown below to VIDEO input.
2. Short-circuit 2P sub-mini connectors on the red and green CPT P.W.B.s to display only the blue beam.
3. Turn the B static (Focus Pack) fully clockwise.
4. Measure the brightness at the center of the screen and turn the B static (Focus Pack) counterclockwise to adjust the brightness of blue as shown in Table below.
5. After the adjustment is completed, if blue exceeds the specification, turn and adjust focus so that the sticking out part of blue satisfies the specification.





UNEVENNESS SPECIFICATION: ±1cd/m²

Defocus brightness specification

Screen Size	Brightness of Blue
50"	37 cd/m²
55"	30 cd/m²

Defocus sticking out specification

Screen Size	Blue sticking out
50"	2.0 mm
55"	2.0 mm

Condition: User controls are set to the initial set positions (for shipment) Measuring point Screen center.

Cautions: Correct the brightness gauge and amplitude of the all-white signal periodically. The aperture angle of the brightness gauge is 1°.
Use a cross-hatch pattern to check.

3.4. CONVERGENCE ADJUSTMENT

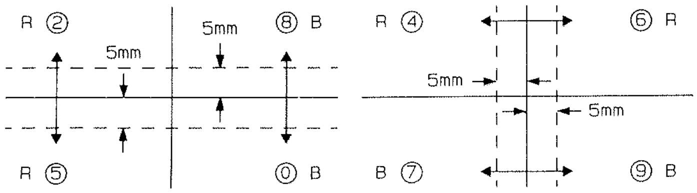
3.4.1. Static convergence adjustment

Adjustment preparation

1. The screen can face east or west.
2. Display the cross pattern signal or the cross-hatch pattern signal.
3. R, G and B lens focus adjustment and R, G and B raster inclination adjustment should have been completed.
4. G raster position adjustment, pincushion distortion, and keystone distortion adjustments should have been completed.
5. R and B raster position (centering magnet) adjustment should have been completed.
6. The dynamic convergence should have been coarse adjusted previously.

Adjustment procedure

1. Set to CONVERGENCE mode using the MENU and CURSOR buttons of the remote control.
2. Check that the variable range of the static convergence adjustment is obtained as shown below using the cursor buttons of the remote control transmitter.
3. RV, BV RH, BH



If the adjustment cannot be done, turn the centering magnets for R and B and re-adjust the R and B raster position.

Note: (1) Refer to page 14 for static convergence adjustment.
(2) Return TV set to normal mode by pressing the MENU button on the remote control.
(3) Static convergence is set to standard mode during memory initialization.

3.4.2. Dynamic convergence adjustment

Adjustment preparation

1. The screen can face any direction, north, south, east and west.
2. Start adjustment 20 minutes or more after the power switch is turned on.
3. Display the cross-hatch pattern signal.
4. The following adjustments should have been completed for R, G and B.
   (a) Lens focus
   (b) Raster (deflection yoke) inclination
   (c) Raster position
5. The following adjustments should have been completed for the G raster.
   (a) Pincushion distortion
   (b) Keystone distortion
   (c) Vertical amplitude
   (d) Horizontal amplitude
6. Horizontal AFC adjustment should be completed.
7. Contrast: Max., Brightness: Center
8. Static convergence should be set to standard mode (memory initialization).

Adjustment procedure

1. R adjustment - Match the R with the G following the procedure shown in Tables 3-4-1 and 3-4-2. At the same time, perform the static convergence adjustment of R.
2. B adjustment - Match the B with the G following the procedure shown in Tables 3-4-1 and 3-4-2. At the same time, perform the static convergence adjustment of B.
3. Adjust repeatedly so that the amount of misconvergence of all colors is minimized.
   (a) If convergence of the vertical line at the right end is drifted, match it using RUJ3 (red) or RUK2 (blue).
   (b) If convergence of the vertical line at the left end is drifted, match it using RUJ7 (red) or RUK6 (blue).
4. After adjustment, re-adjust R and B raster position.
5. After the static convergence adjustment and dynamic convergence adjustment are completed, fix the centering magnet (located on the R and B deflection yokes) using white paint.

Note: (1) When adjusting the R, turn off the B using any one of the following procedures as required.
(a) short-circuit the 2P subminiature connector plug pins on the B CPT P.W.B.
(b) Apply cover to the B lens.
(2) When adjusting the B, turn off the R using any one of the following procedures as required.
(a) short-circuit the 2P subminiature connector plug pins on the R CPT P.W.B.
(b) Apply cover to the R lens.
(3) The position of VRs and the movement of the bright lines are shown in Fig. 3-4-3 and Fig. 3-4-4.

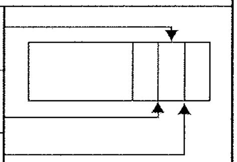
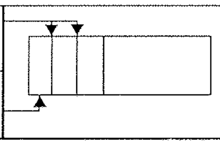
Table 3-4-1. Dynamic convergence adjustment of the horizontal line (RED/BLUE)

No.	Adjustment Item		Adj. VR		Adjustment Details
			RED	BLUE	
1	Horizontal center line	Vertical skew V-SKEW	RU25	RU53	Remove the inclination of the horizontal center line.
2		Vertical bow V-BOW	RU23	RU51	Correct the bow distortion of the horizontal center line and make it a straight line.
3	Lower horizontal line	Upper/lower pincushion distortion V-PIN	RU05	RU33	Correct the bow distortion of the lower horizontal line and make it a straight line.
4		Upper/lower keystone distortion V-KEY	RU13	RU41	Remove the inclination of the lower horizontal line.
5	Upper horizontal line	Upper pincushion distortion V-U-PIN	RU01	RU29	Correct the bow distortion of the upper horizontal line and make it a straight line.
6		Upper keystone distortion V-U-KEY	RU09	RU37	Remove the inclination of the upper horizontal line.
7	Upper/lower horizontal line	Vertical size V-SIZE	RU19	RU47	Match upper/lower horizontal line with the green line by changing the vertical size.
8		Vertical linearity V-LIN	RU17	RU45	Match upper/lower horizontal line with the green line by changing the linearity.

Note:

1. Adjustment procedure of the horizontal lines (1) Center, (2) Lower, (3) Upper and then (4) Upper/Lower.
2. Accurately match the horizontal center lines (red/blue) with the green line using the centering magnets (item 3-3-2).
3. The adjustment VRs shown in items 7 and 8 of above table (RU19, RU47, RU17, RU45) as well as BV-Center (RUP4), BH-Center (RUP8), RV-Center (RUQ3), and RH-Center (RUQ7), should have been set to their mechanical centers previously.

Table 3-4-2. Dynamic convergence adjustment of the vertical line (RED/BLUE)

No.	Adjustment Item		Adj. VR		Adjustment Details	
			RED	BLUE		
1	Vertical center line	Horizontal skew H-SKEW	RU82	RUE3	Remove the inclination of the vertical center line.	
2		Horizontal bow H-BOW	RU80	RUE1	Correct the bow distortion of the vertical center line and make it a straight line.	
3	Right side vertical line	Left/right pincushion distortion H-PIN	RU61	RU90	Correct the bow distortion of the right side vertical line and make it a straight line.	
4		Left/right keystone distortion H-KEY	RU69	RU98	Remove the inclination of the right side vertical line.	
5		Horizontal size H-SIZE	RU76	RUA6	Extend 2nd vertical line from the left/right side.	
6		Horizontal linearity H-LIN	RU73	RUA3	Match 2nd vertical line from the right end with green line.	
7		Right end line linearity H-R-LIN	RUJ3	RUK2	Match right end line with the green line.	
8	Left side vertical line	Left pincushion distortion H-L-PIN	RU57	RU86	Correct the bow distortion of the left side vertical line and make it a straight line.	
9		Left keystone distortion H-L-KEY	RU65	RU94	Remove the inclination of the vertical line on the left side.	
10		Left horizontal size H-L-SIZE	RUL1	RUL5	Match left side vertical line with the green line.	
11		Left end line linearity H-L-LIN	RUJ7	RUK6	Match left end vertical line with the green line.	

Note:

1. Adjustment procedure of the vertical lines (1) Center, (2) Right, and then (3) Left line.
2. Accurately match the vertical center lines (red/blue) with the green line using the centering magnets (item 3-3-2).
3. The adjustment VRs shown in items 5, 6, 7, 10 and 11 (RU76, RUA6, RU73, RUA3, RUJ3, RUK2, RUL1, RUL5, RUJ7 and RUK6) as well as RH-Center (RUQ7) and BH-Center (RUP8), should have been set to their mechanical centers previously.
4. Including centering magnets, adjust repeatedly as required.

MOVEMENT OF THE BRIGHT LINE
(This shows the movement of the bright line corresponding to the adjustment VR.)

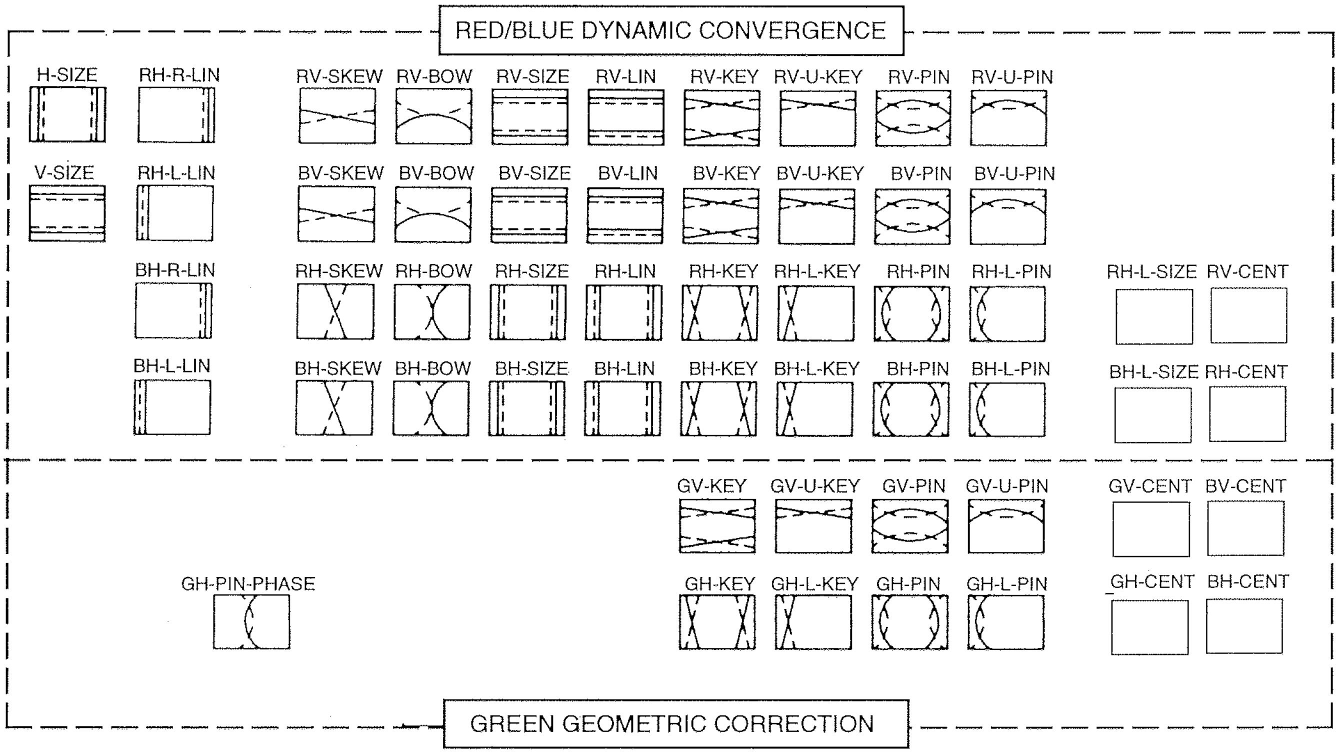

RED/BLUE DYNAMIC CONVERGENCE
H-SIZE
RH-R-LIN
RV-SKEW
RV-BOW
RV-SIZE
RV-LIN
RV-KEY
RV-U-KEY
RV-PIN
RV-U-PIN
V-SIZE
RH-L-LIN
BV-SKEW
BV-BOW
BV-SIZE
BV-LIN
BV-KEY
BV-U-KEY
BV-PIN
BV-U-PIN
BH-R-LIN
RH-SKEW
RH-BOW
RH-SIZE
RH-LIN
RH-KEY
RH-L-KEY
RH-PIN
RH-L-PIN
RH-L-SIZE
RV-CENT
BH-L-LIN
BH-SKEW
BH-BOW
BH-SIZE
BH-LIN
BH-KEY
BH-L-KEY
BH-PIN
BH-L-PIN
BH-L-SIZE
RH-CENT
GV-KEY
GV-U-KEY
GV-PIN
GV-U-PIN
GV-CENT
BV-CENT
GH-PIN-PHASE
GH-KEY
GH-L-KEY
GH-PIN
GH-L-PIN
GH-CENT
BH-CENT
GREEN GEOMETRIC CORRECTION

Fig. 3-4-3

LAYOUT OF THE ADJUSTMENT VR

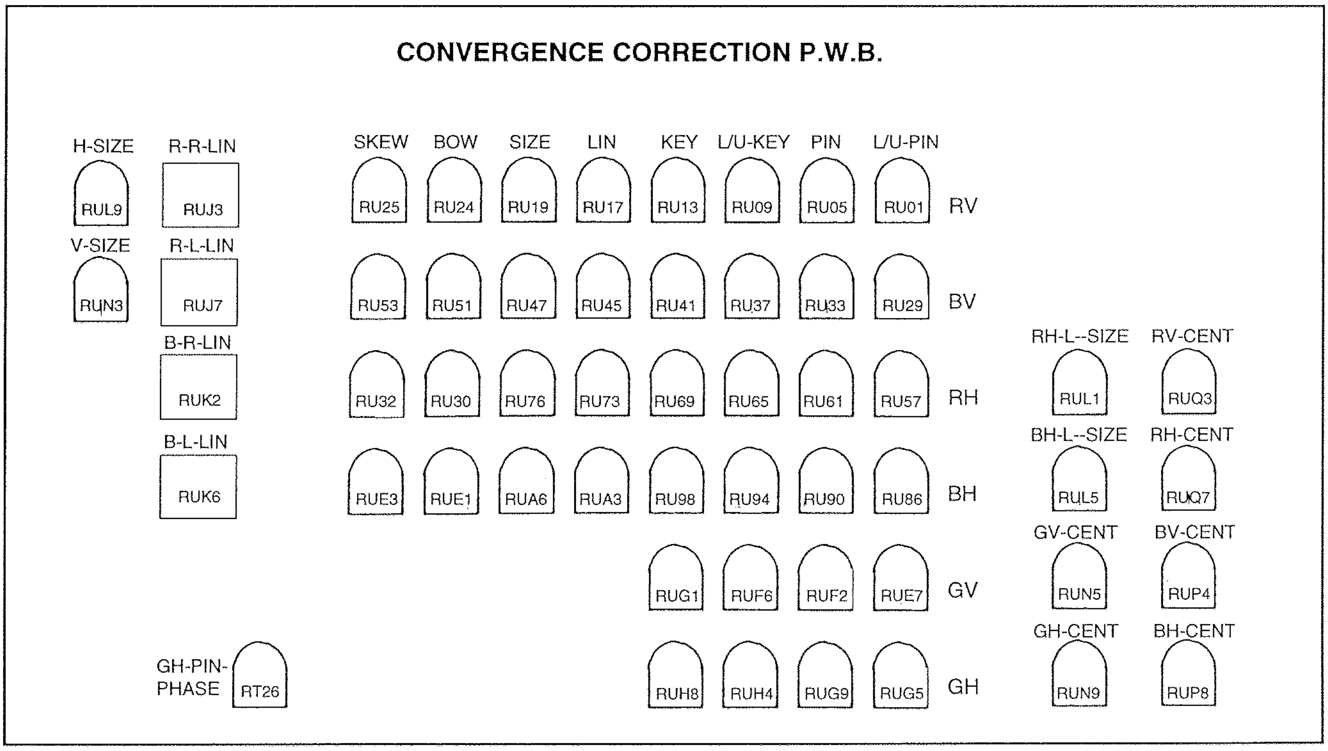
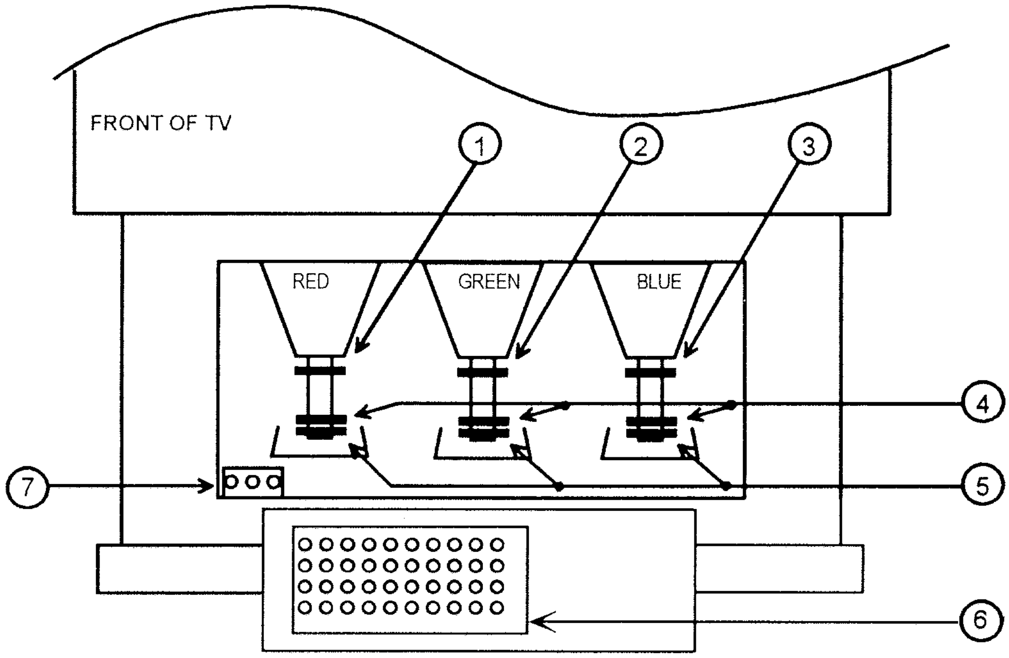

CONVERGENCE CORRECTION P.W.B.
H-SIZE
RUL9
R-R-LIN
RUJ3
V-SIZE
RUN3
R-L-LIN
RUJ7
B-R-LIN
RUK2
B-L-LIN
RUK6
SKEW
BOW
SIZE
LIN
KEY
L/U-KEY
PIN
L/U-PIN
RU25
RU24
RU19
RU17
RU13
RU09
RU05
RU01
RV
RU53
RU51
RU47
RU45
RU41
RU37
RU33
RU29
BV
RU32
RU30
RU76
RU73
RU69
RU65
RU61
RU57
RH
RUE3
RUE1
RUA6
RUA3
RU98
RU94
RU90
RU86
BH
RUG1
RUF6
RUF2
RUE7
GV
GH-PIN-PHASE
RT26
RUH8
RUH4
RUG9
RUG5
GH
RH-L--SIZE
RUL1
RV-CENT
RUQ3
BH-L--SIZE
RUL5
RH-CENT
RUQ7
GV-CENT
RUN5
BV-CENT
RUP4
GH-CENT
RUN9
BH-CENT
RUP8

Fig. 3-4-4

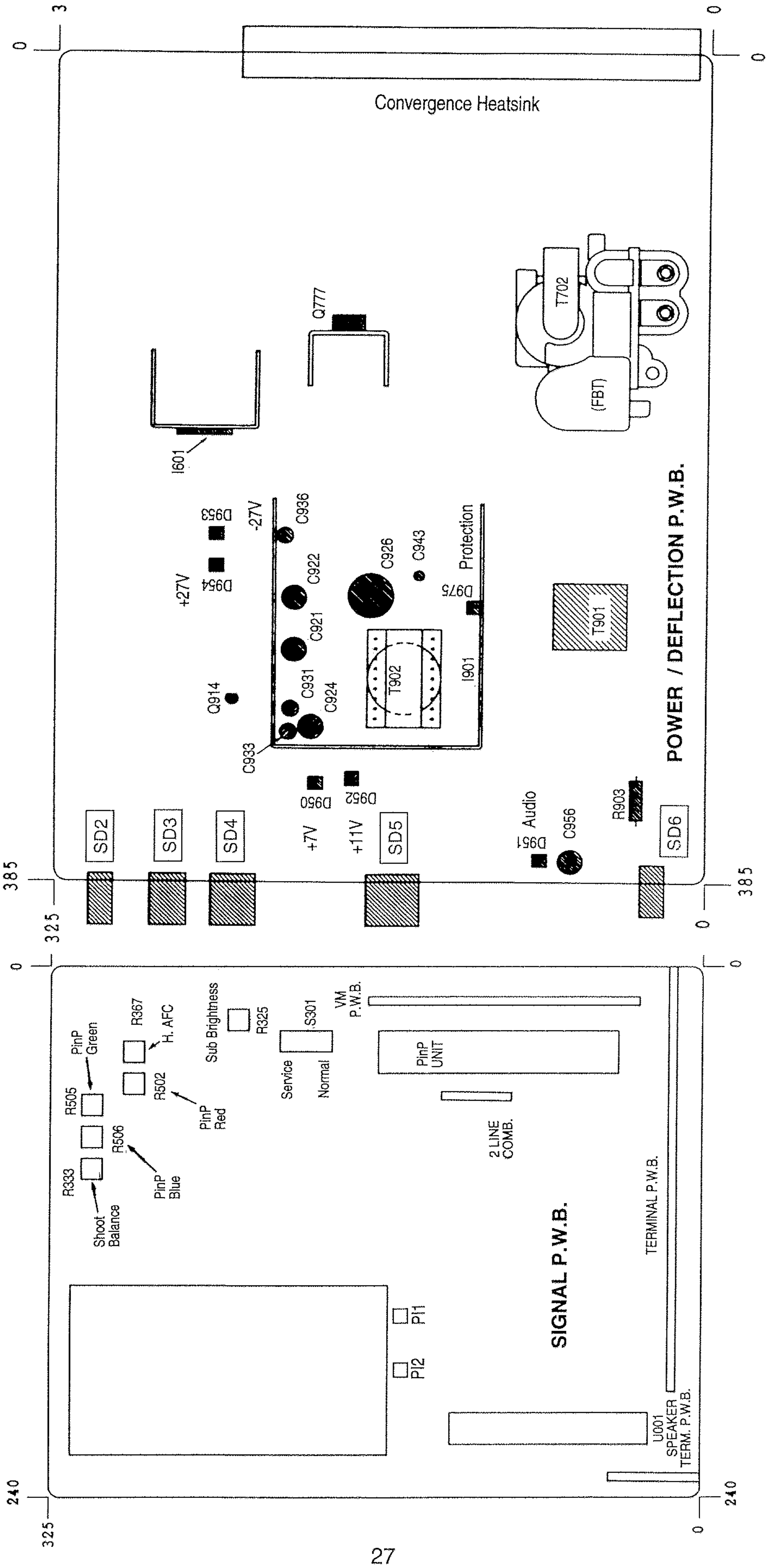
4. ADJUSTMENT POINT

4.1. CRT, cabinet locations



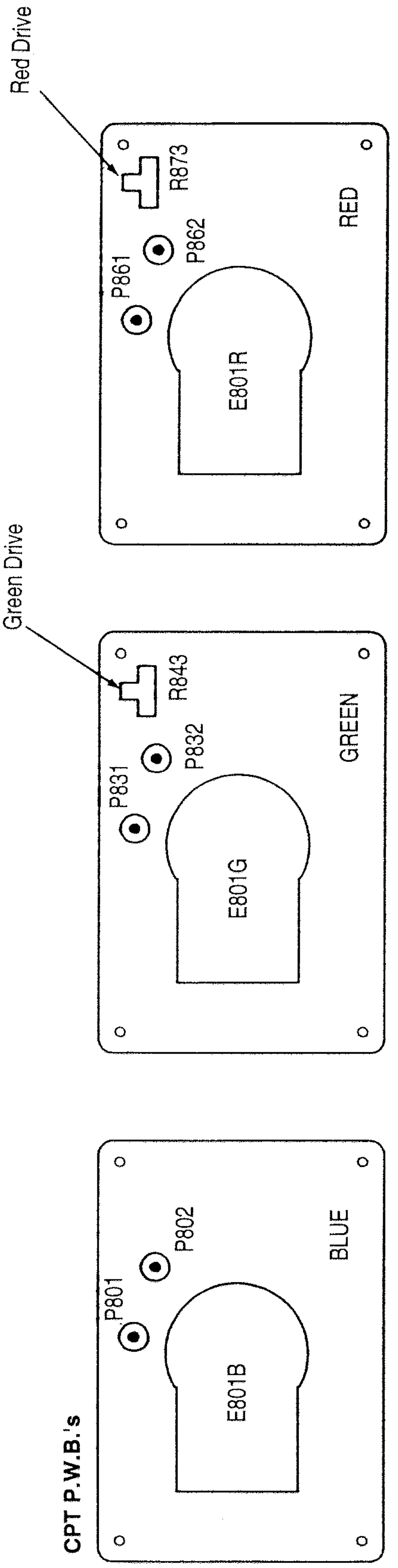
1. CENTERING MAGNET FOR RED PRT
2. CENTERING MAGNET FOR GREEN PRT
3. CENTERING MAGNET FOR BLUE PRT
4. 4-POLE MAGNET FOR BEAM FORM ADJUSTMENT
5. BEAM ALIGNMENT MAGNET
6. CONVERGENCE CORRECTION P.W.B.
7. FOCUS PACK (TOP ADJUSTMENTS FOR FOCUS, BOTTOM FOR SCREEN)

4.2. Signal P.W.B., Power/Deflection P.W.B. adjustment points

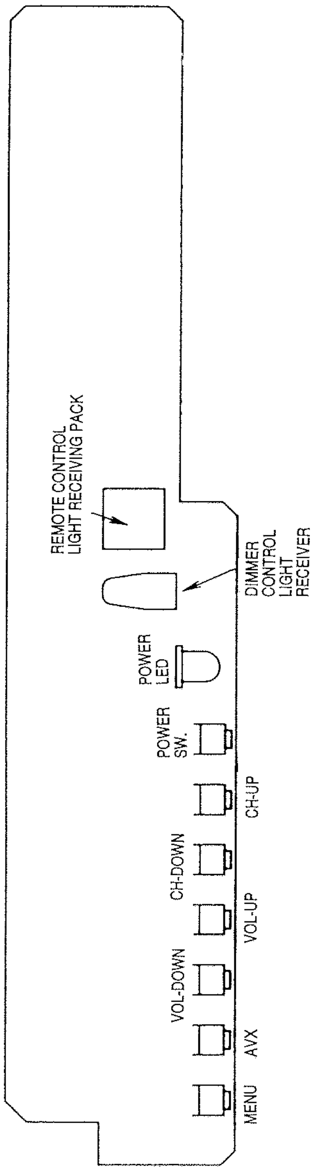

Convergence Heatsink
T702
(FBT)
Q777
I601
D953
-27V
C936
D954
+27V
C922
C926
C943
Protection
D975
C921
T901
T902
I901
Q914
C931
C924
C933
D950
D952
POWER / DEFLECTION P.W.B.
Audio
R903
D951
C956
SD2
SD3
SD4
+7V
+11V
SD5
SD6
PinP Green
R367
H. AFC
Sub Brightness
R325
S301
VM P.W.B.
R505
R502
Service
Normal
PinP UNIT
PinP Red
R506
R333
2 LINE COMB.
PinP Blue
Shoot Balance
SIGNAL P.W.B.
TERMINAL P.W.B.
PI1
PI2
U001 SPEAKER TERM. P.W.B.
0
3
385
325
240

4.3. CPT, Control P.W.B., Focus Pack adjustment points

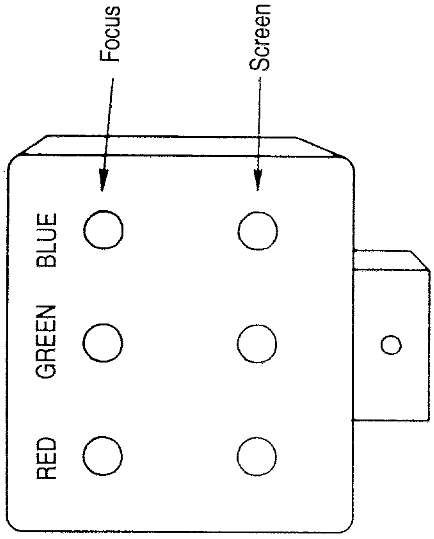
CPT P.W.B.'s


Red Drive
R873
P862
P861
RED
E801R
Green Drive
R843
P832
P831
GREEN
E801G
P802
P801
BLUE
E801B

CONTROL P.W.B.

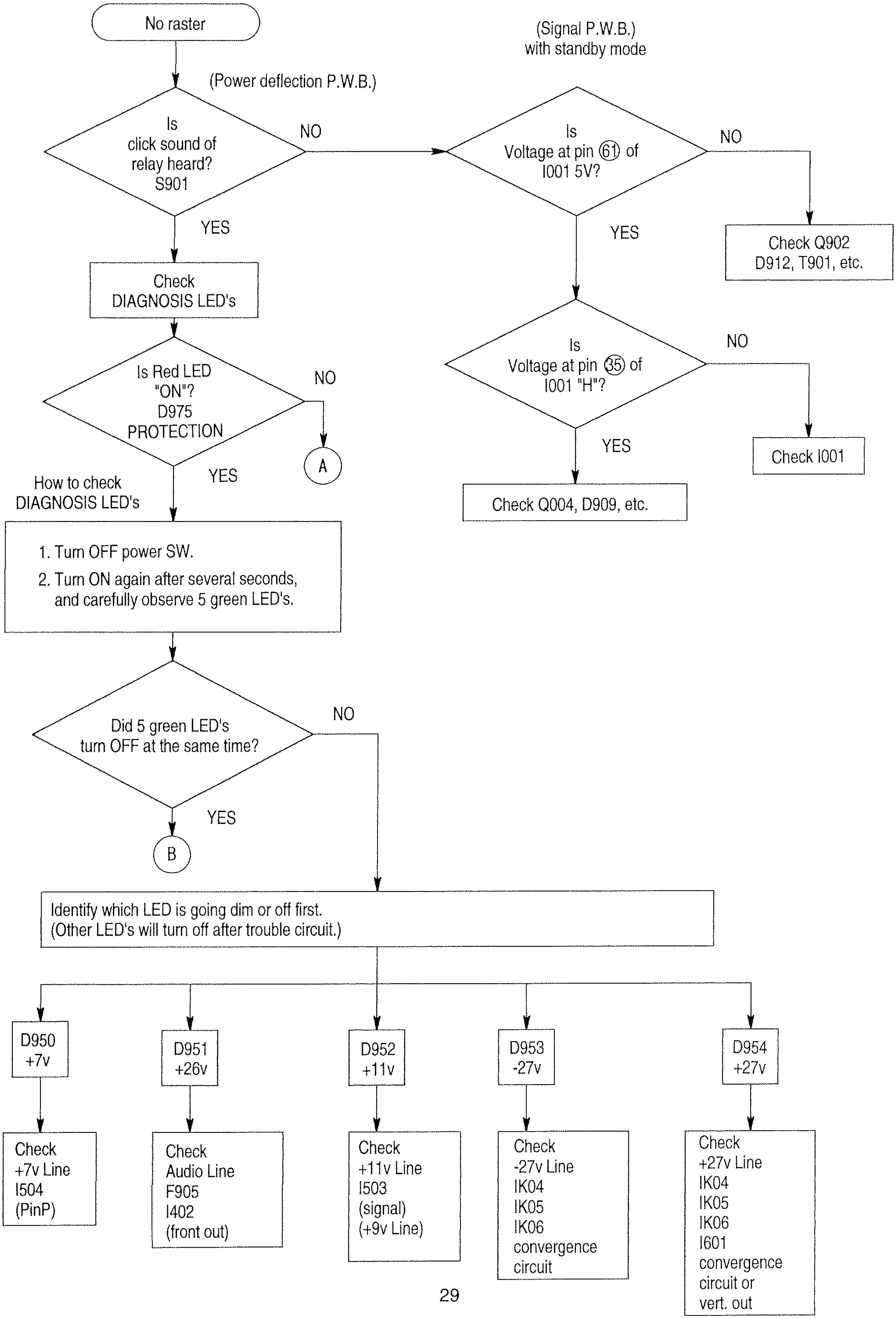

REMOTE CONTROL
LIGHT RECEIVING PACK
DIMMER
CONTROL
LIGHT
RECEIVER
POWER
LED
POWER
SW.
CH-UP
CH-DOWN
VOL-UP
VOL-DOWN
AVX
MENU

FOCUS PACK

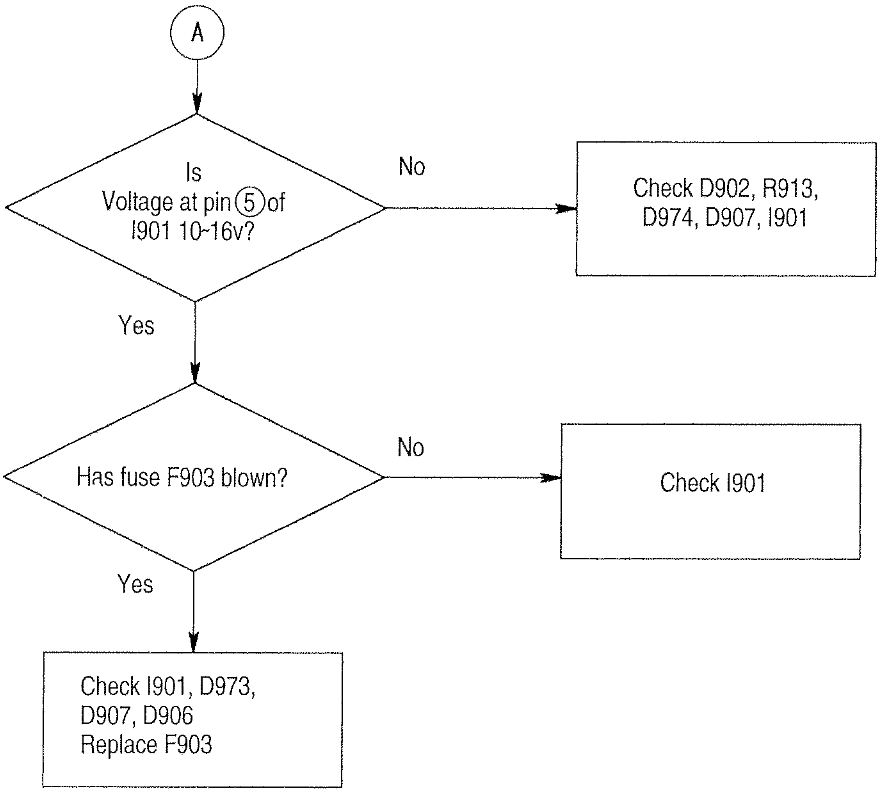

Focus
Screen
BLUE
GREEN
RED

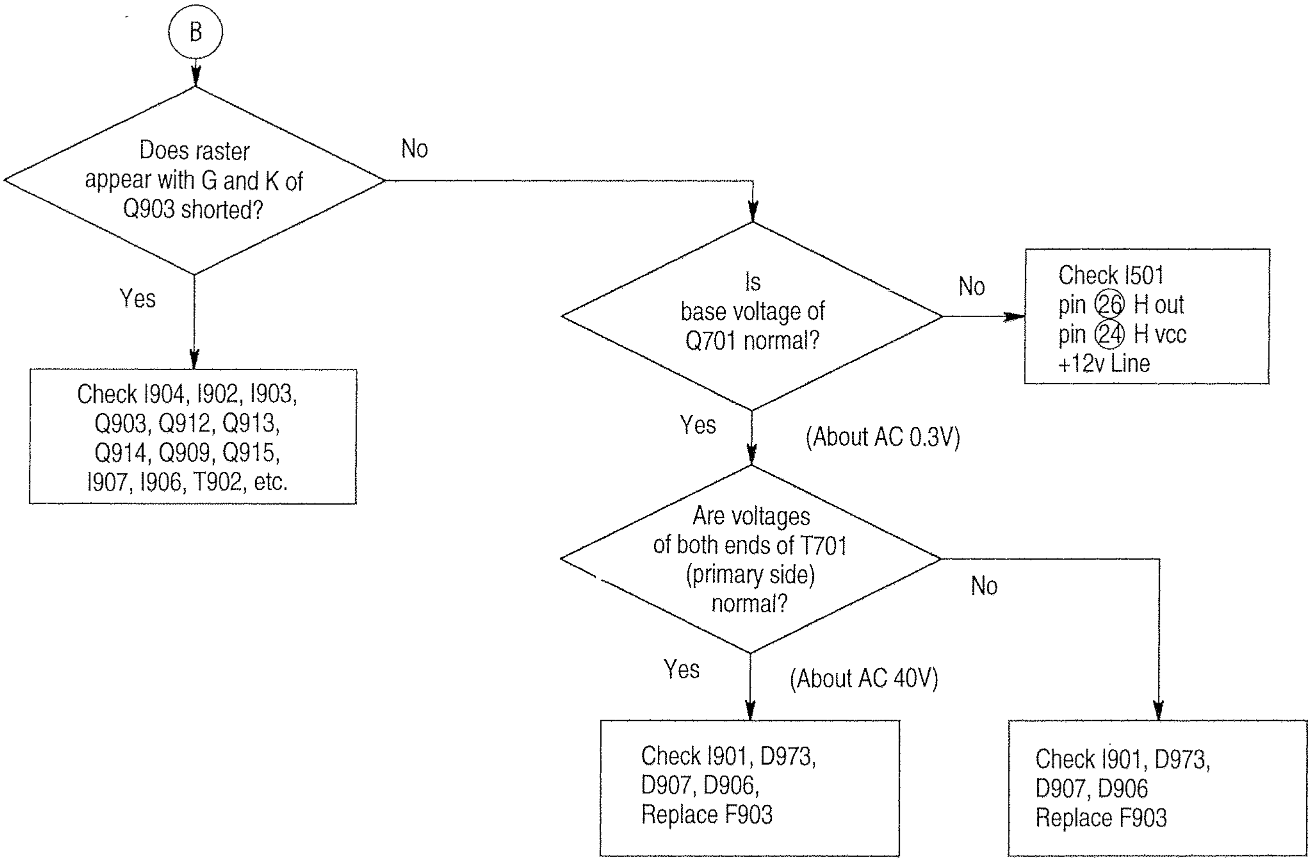
TROUBLESHOOTING

1. No raster


No raster
(Power deflection P.W.B.)
Is click sound of relay heard? S901
NO
YES
Check DIAGNOSIS LED's
Is Red LED "ON"? D975 PROTECTION
NO
A
YES
How to check DIAGNOSIS LED's
1. Turn OFF power SW.
2. Turn ON again after several seconds, and carefully observe 5 green LED's.
Did 5 green LED's turn OFF at the same time?
NO
YES
B
Identify which LED is going dim or off first.
(Other LED's will turn off after trouble circuit.)
D950 +7v
D951 +26v
D952 +11v
D953 -27v
D954 +27v
Check +7v Line I504 (PinP)
Check Audio Line F905 I402 (front out)
Check +11v Line I503 (signal) (+9v Line)
Check -27v Line IK04 IK05 IK06 convergence circuit
Check +27v Line IK04 IK05 IK06 I601 convergence circuit or vert. out
(Signal P.W.B.) with standby mode
Is Voltage at pin (61) of I001 5V?
NO
Check Q902 D912, T901, etc.
YES
Is Voltage at pin ㉟ of I001 "H"?
NO
Check I001
YES
Check Q004, D909, etc.

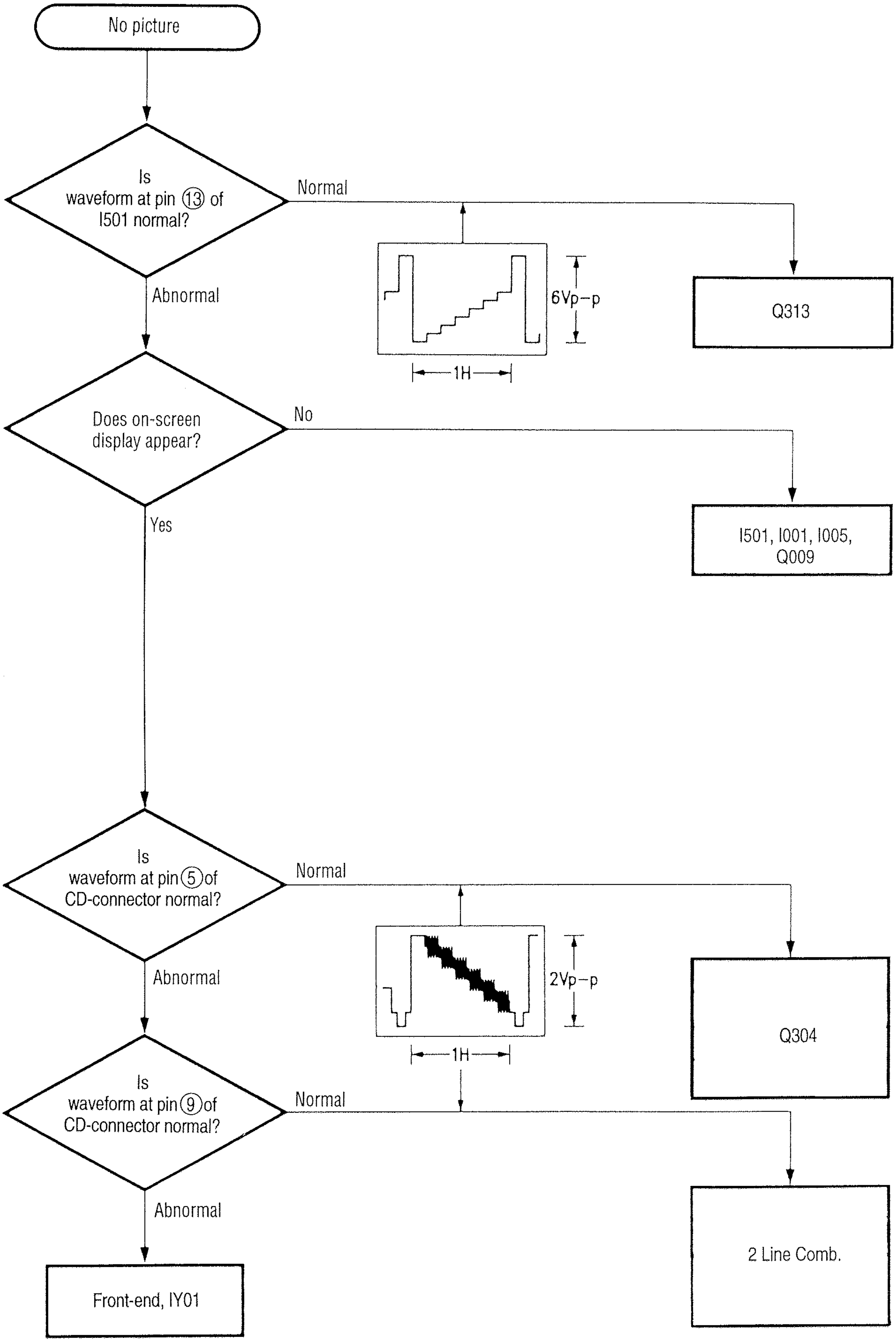
TROUBLESHOOTING


A
Is Voltage at pin ⑤ of I901 10~16v?
No
Check D902, R913, D974, D907, I901
Yes
Has fuse F903 blown?
No
Check I901
Yes
Check I901, D973, D907, D906 Replace F903


B
Does raster appear with G and K of Q903 shorted?
No
Yes
Check I904, I902, I903, Q903, Q912, Q913, Q914, Q909, Q915, I907, I906, T902, etc.
Is base voltage of Q701 normal?
No
Check I501 pin ㉖ H out pin ㉔ H vcc +12v Line
Yes
(About AC 0.3V)
Are voltages of both ends of T701 (primary side) normal?
No
Yes
(About AC 40V)
Check I901, D973, D907, D906, Replace F903
Check I901, D973, D907, D906 Replace F903

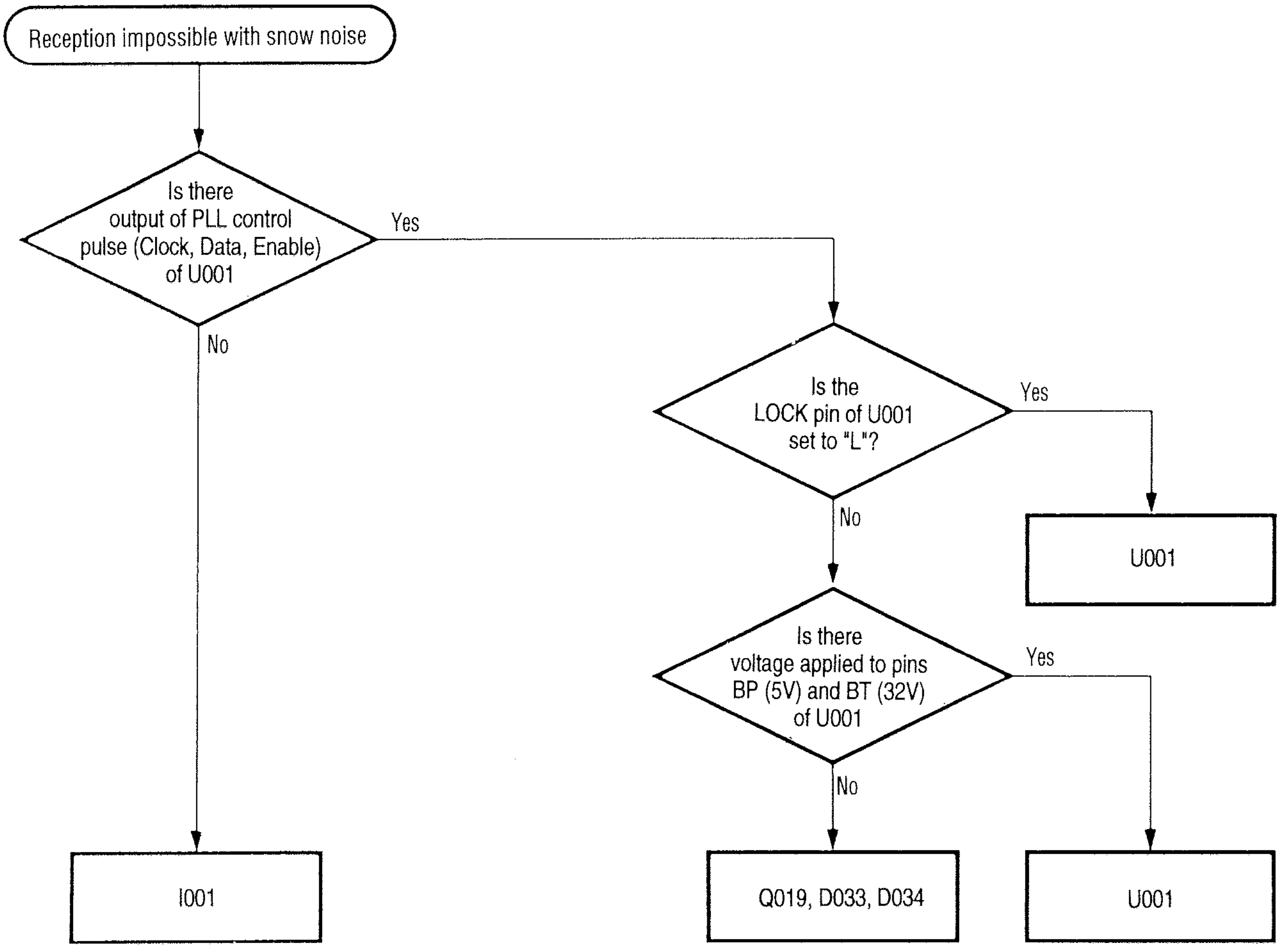
TROUBLESHOOTING

2. No picture

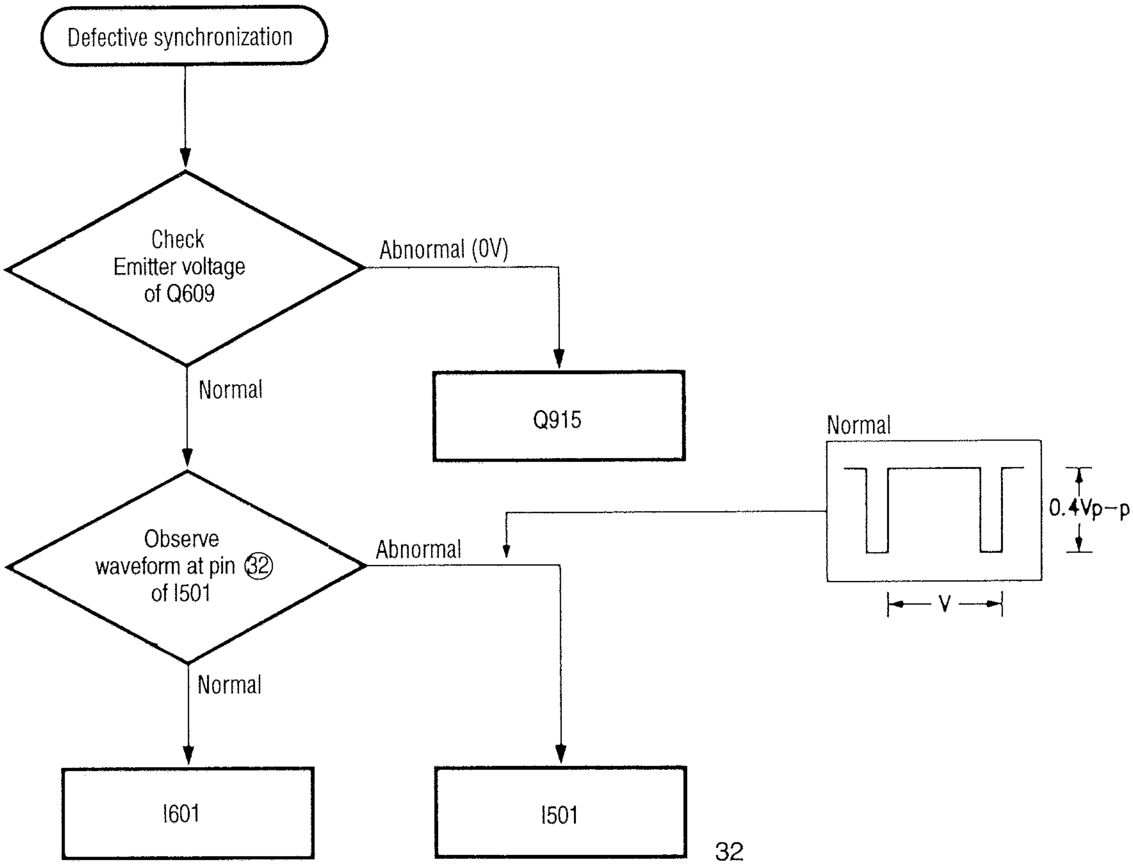

No picture
Is waveform at pin ⑬ of I501 normal?
Normal
Abnormal
6Vp−p
1H
Q313
Does on-screen display appear?
No
Yes
I501, I001, I005, Q009
Is waveform at pin ⑤ of CD-connector normal?
Normal
Abnormal
2Vp−p
1H
Q304
Is waveform at pin ⑨ of CD-connector normal?
Normal
Abnormal
Front-end, IY01
2 Line Comb.

TROUBLESHOOTING

3. Reception impossible with snow noise

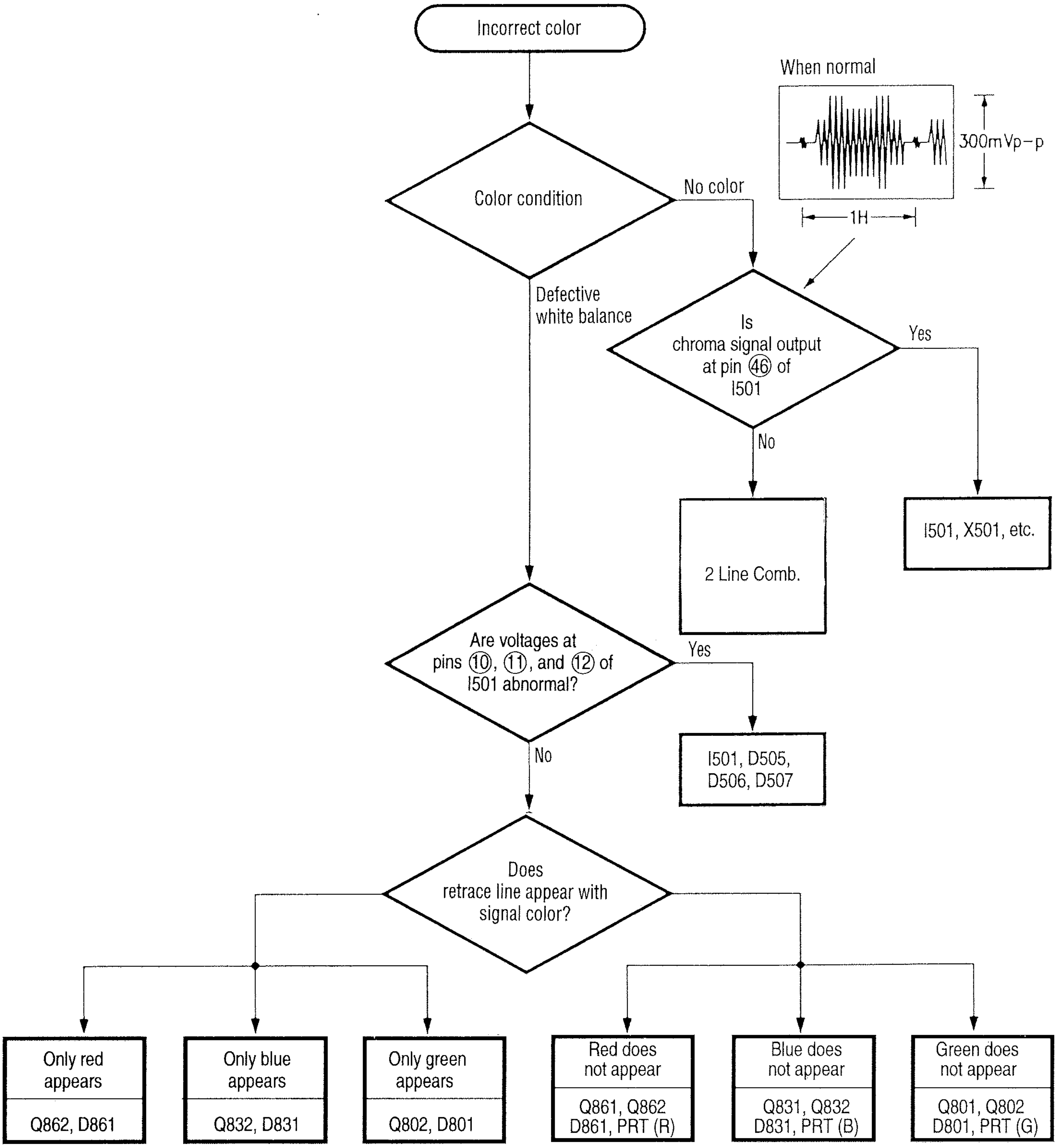

Reception impossible with snow noise
Is there output of PLL control pulse (Clock, Data, Enable) of U001
Yes
No
Is the LOCK pin of U001 set to "L"?
Yes
No
U001
Is there voltage applied to pins BP (5V) and BT (32V) of U001
Yes
No
I001
Q019, D033, D034
U001

4. Defective synchronization


Defective synchronization
Check Emitter voltage of Q609
Abnormal (0V)
Normal
Q915
Normal
0.4Vp-p
V
Observe waveform at pin ㉜ of I501
Abnormal
Normal
I601
I501

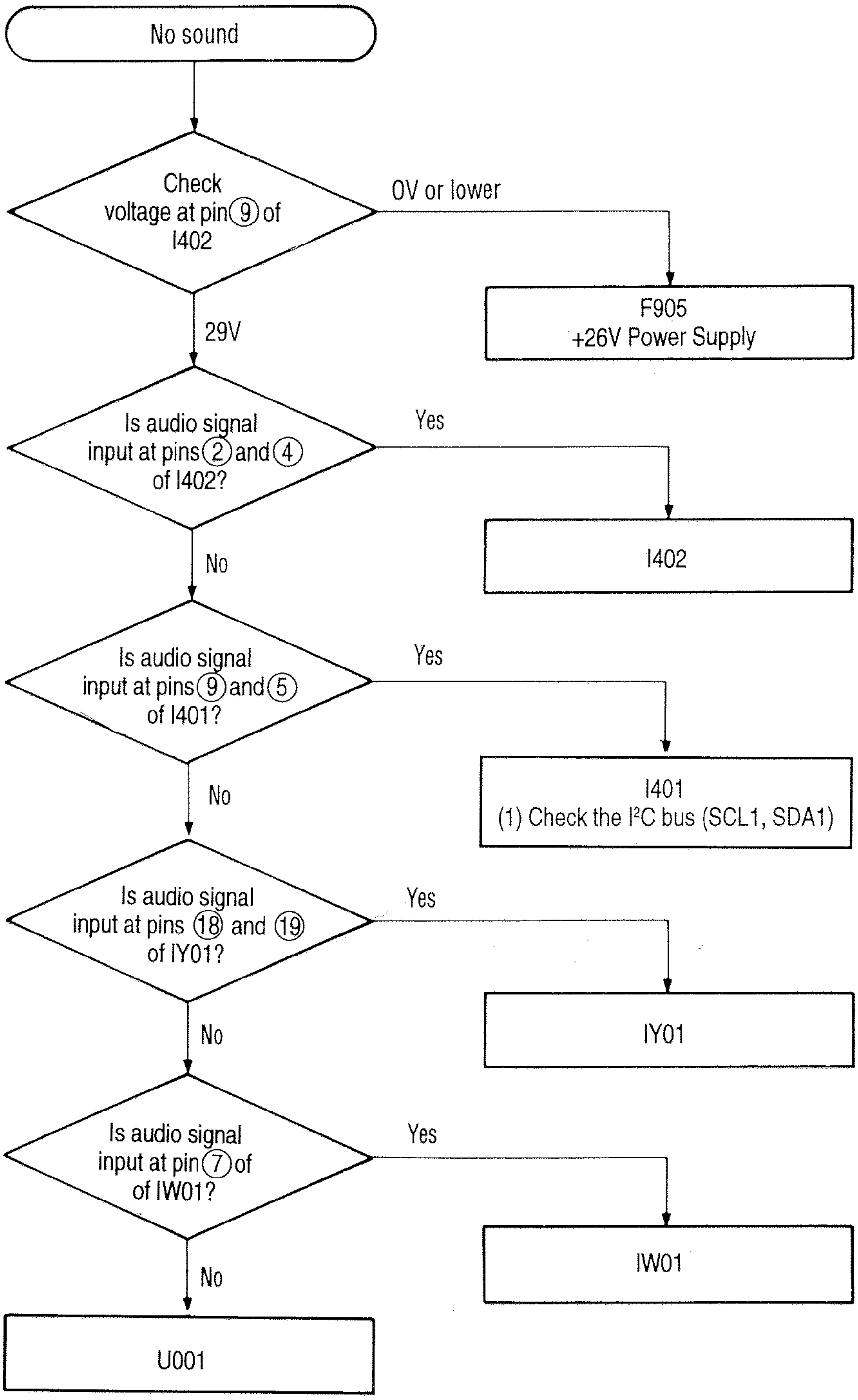
TROUBLESHOOTING

5. Incorrect color


Incorrect color
Color condition
No color
Defective white balance
When normal
300mVp-p
1H
Is chroma signal output at pin ㊻ of I501
Yes
No
2 Line Comb.
I501, X501, etc.
Are voltages at pins ⑩, ⑪, and ⑫ of I501 abnormal?
Yes
I501, D505, D506, D507
No
Does retrace line appear with signal color?
Only red appears
Q862, D861
Only blue appears
Q832, D831
Only green appears
Q802, D801
Red does not appear
Q861, Q862 D861, PRT (R)
Blue does not appear
Q831, Q832 D831, PRT (B)
Green does not appear
Q801, Q802 D801, PRT (G)

TROUBLESHOOTING

6. No sound

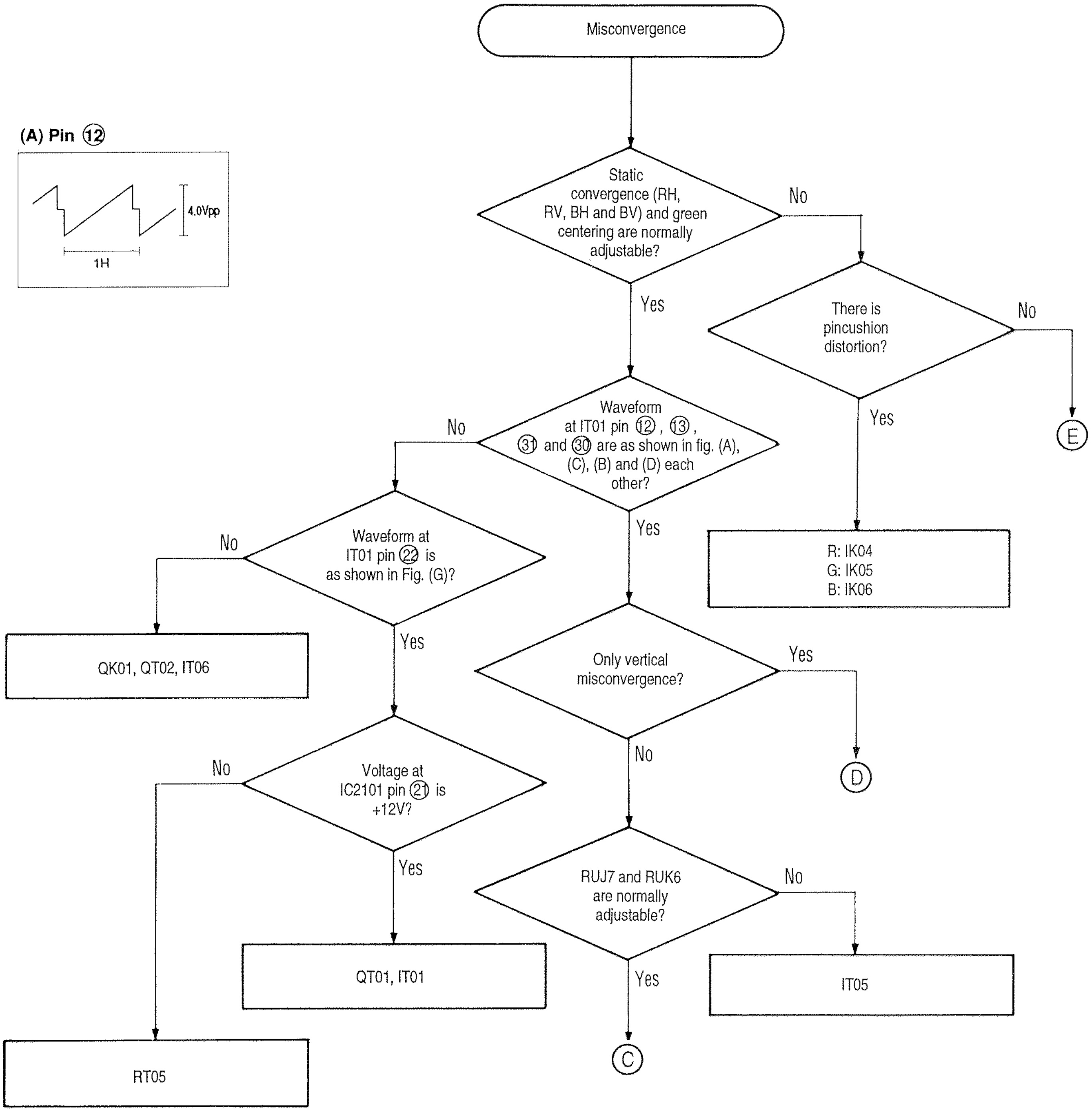

No sound
Check voltage at pin ⑨ of I402
0V or lower
F905 +26V Power Supply
29V
Is audio signal input at pins ② and ④ of I402?
Yes
I402
No
Is audio signal input at pins ⑨ and ⑤ of I401?
Yes
I401 (1) Check the I²C bus (SCL1, SDA1)
No
Is audio signal input at pins ⑱ and ⑲ of IY01?
Yes
IY01
No
Is audio signal input at pin ⑦ of of IW01?
Yes
IW01
No
U001

TROUBLESHOOTING

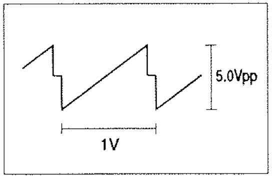
7. Misconvergence

(A) Pin ⑫

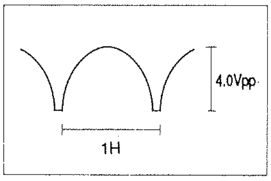
4.0Vpp
1H


Misconvergence
Static convergence (RH, RV, BH and BV) and green centering are normally adjustable?
No
There is pincushion distortion?
No
E
Yes
R: IK04
G: IK05
B: IK06
Yes
Waveform at IT01 pin ⑫, ⑬, ㉛ and ㉚ are as shown in fig. (A), (C), (B) and (D) each other?
No
Waveform at IT01 pin ㉒ is as shown in Fig. (G)?
No
QK01, QT02, IT06
Yes
Voltage at IC2101 pin ㉑ is +12V?
No
RT05
Yes
QT01, IT01
Yes
Only vertical misconvergence?
Yes
D
No
RUJ7 and RUK6 are normally adjustable?
No
IT05
Yes
C

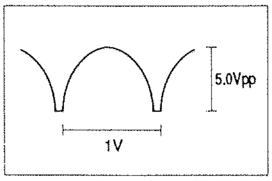
(B) Pin ㉛



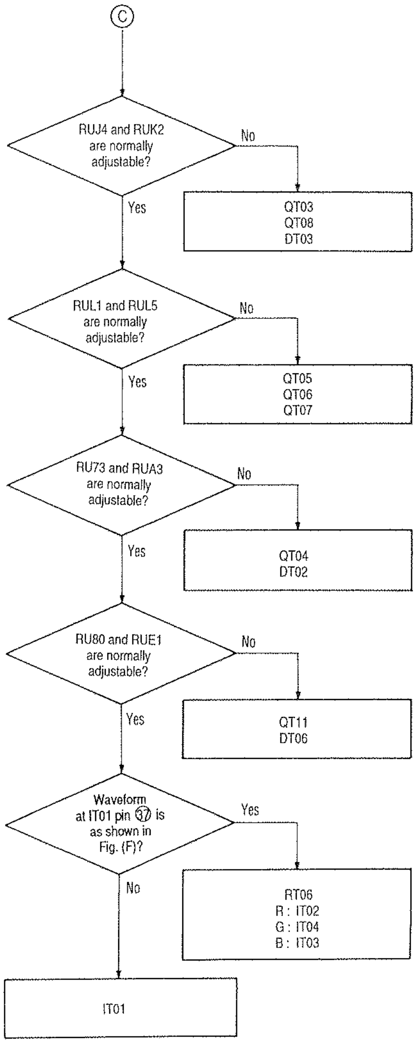
(C) Pin ⑬

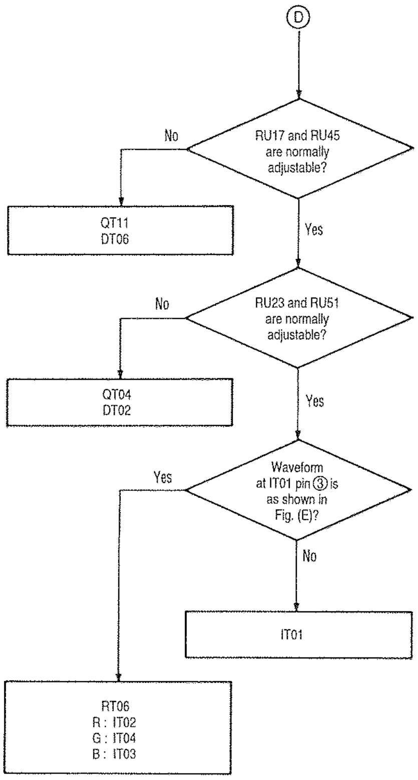


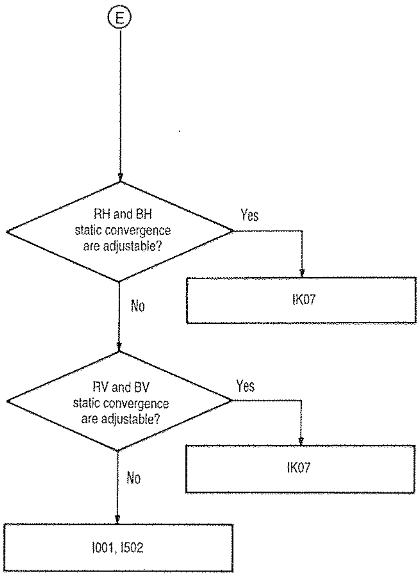
(D) Pin ㉚



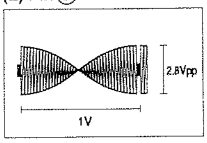
TROUBLESHOOTING


C
RUJ4 and RUK2 are normally adjustable?
No
QT03
QT08
DT03
Yes
RUL1 and RUL5 are normally adjustable?
No
QT05
QT06
QT07
Yes
RU73 and RUA3 are normally adjustable?
No
QT04
DT02
Yes
RU80 and RUE1 are normally adjustable?
No
QT11
DT06
Yes
Waveform at IT01 pin ㊲ is as shown in Fig. (F)?
Yes
RT06
R : IT02
G : IT04
B : IT03
No
IT01

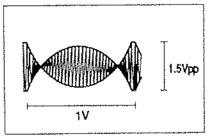

D
RU17 and RU45 are normally adjustable?
No
QT11
DT06
Yes
RU23 and RU51 are normally adjustable?
No
QT04
DT02
Yes
Waveform at IT01 pin ③ is as shown in Fig. (E)?
Yes
RT06
R : IT02
G : IT04
B : IT03
No
IT01


E
RH and BH static convergence are adjustable?
Yes
IK07
No
RV and BV static convergence are adjustable?
Yes
IK07
No
I001, I502

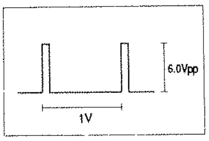
(E) Pin ③



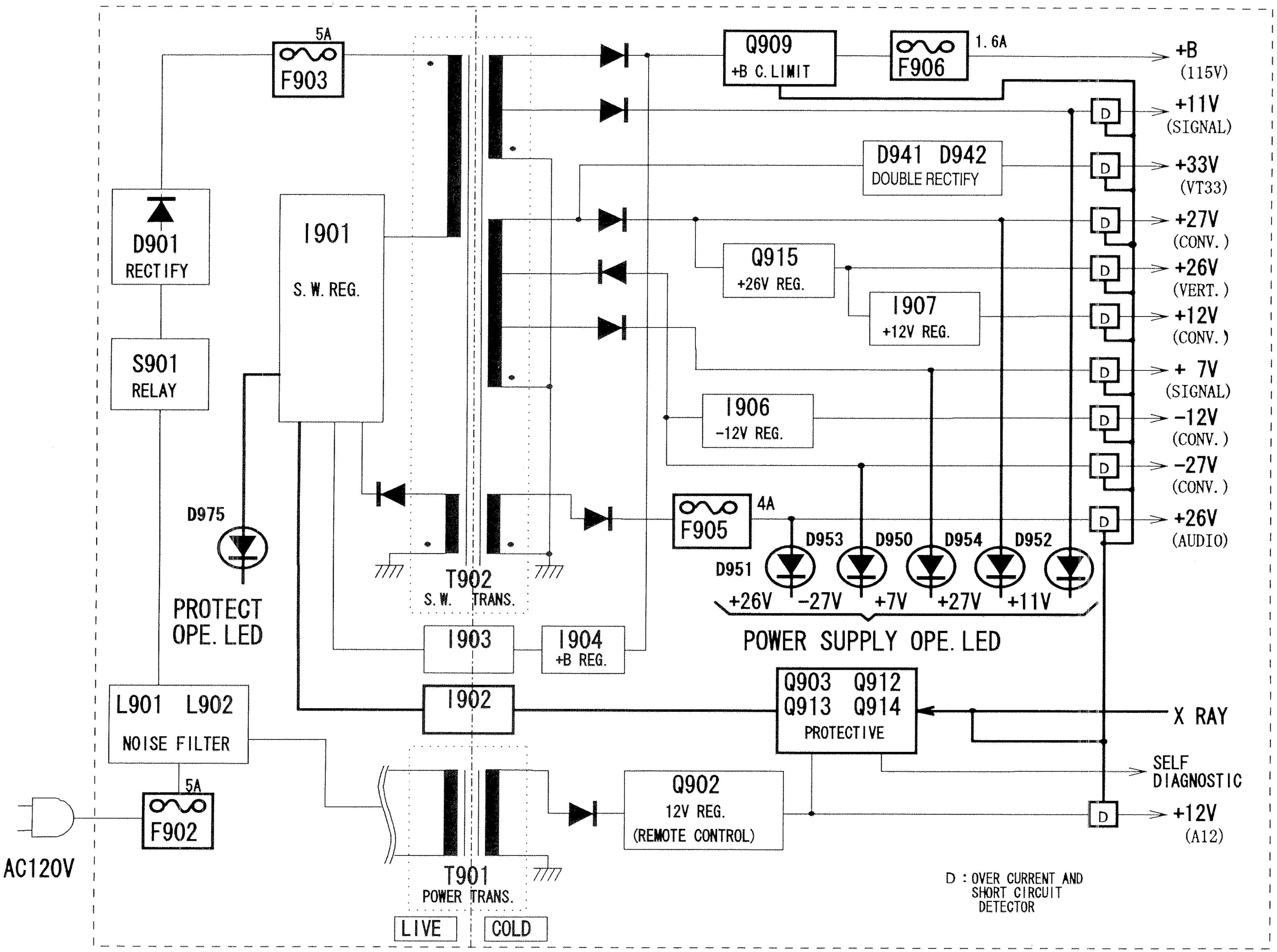
(F) Pin ㊲



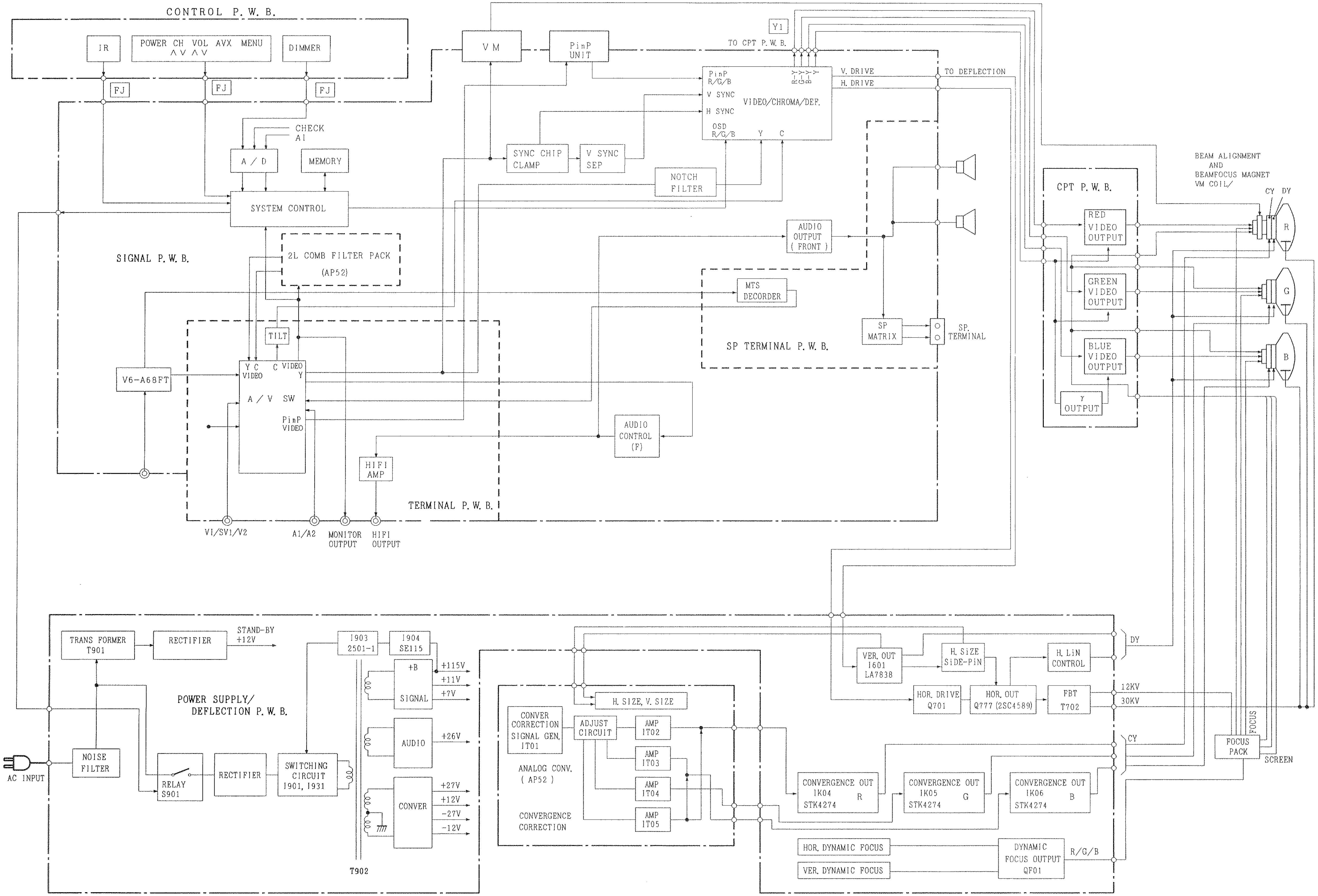
(G) Pin ㉒



PROTECTION CIRCUIT BLOCK DIAGRAM

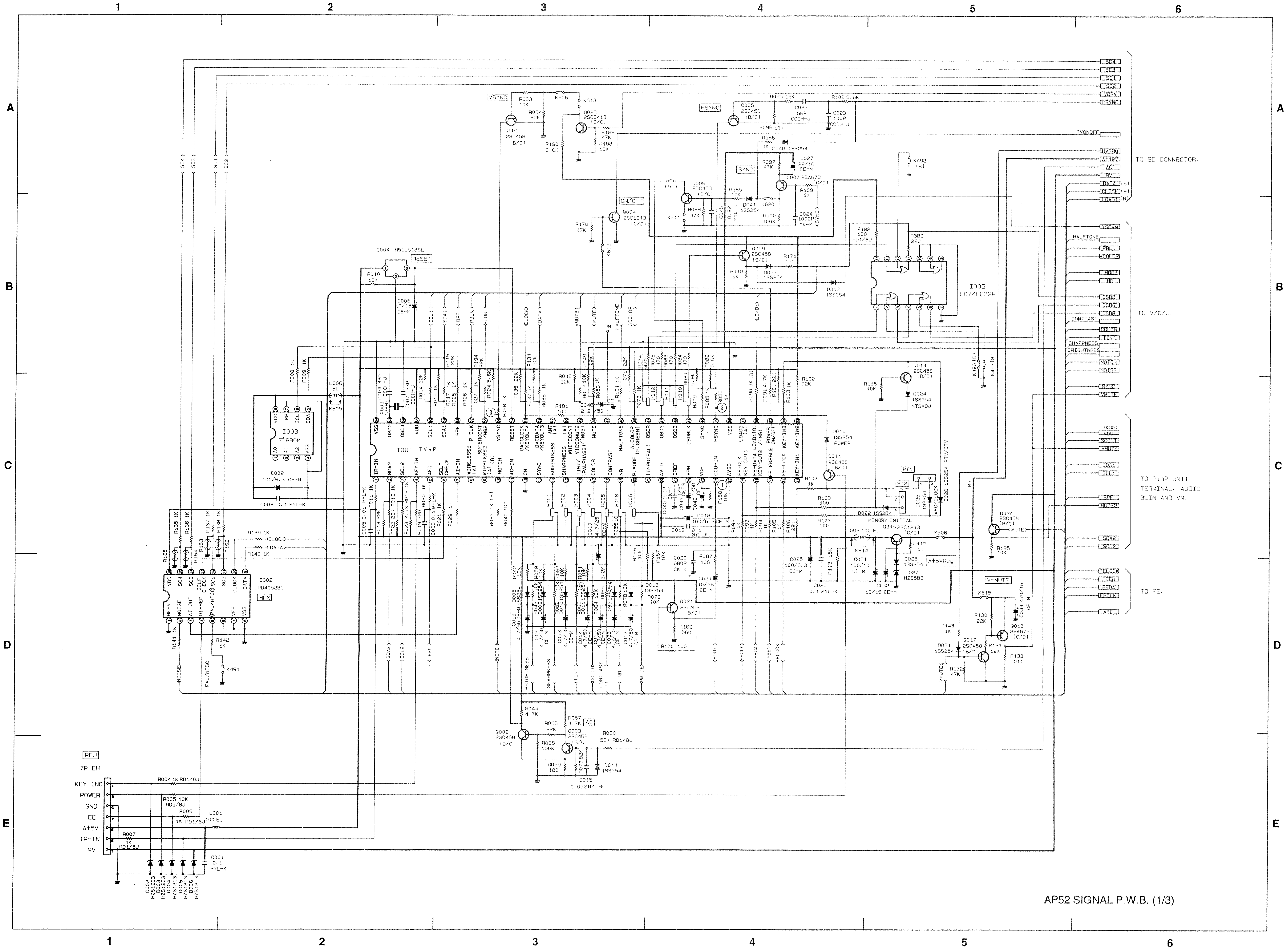

5A
F903
D901
RECTIFY
S901
RELAY
I901
S.W. REG.
D975
PROTECT
OPE. LED
L901 L902
NOISE FILTER
5A
F902
AC120V
T902
S.W. TRANS.
I903
I904
+B REG.
I902
T901
POWER TRANS.
LIVE
COLD
Q909
+B C.LIMIT
F906
1.6A
+B
(115V)
D941 D942
DOUBLE RECTIFY
Q915
+26V REG.
I907
+12V REG.
I906
-12V REG.
F905
4A
D953
D950
D954
D952
D951
+26V
-27V
+7V
+27V
+11V
POWER SUPPLY OPE. LED
Q903 Q912
Q913 Q914
PROTECTIVE
Q902
12V REG.
(REMOTE CONTROL)
D
+11V
(SIGNAL)
+33V
(VT33)
+27V
(CONV.)
+26V
(VERT.)
+12V
(CONV.)
+ 7V
(SIGNAL)
-12V
(CONV.)
-27V
(CONV.)
+26V
(AUDIO)
X RAY
SELF
DIAGNOSTIC
+12V
(A12)
D : OVER CURRENT AND
SHORT CIRCUIT
DETECTOR

AP52 BLOCK DIAGRAM


CONTROL P. W. B.
IR
POWER CH VOL AVX MENU
∧∨ ∧∨
DIMMER
FJ
FJ
FJ
CHECK
AI
A / D
MEMORY
SYSTEM CONTROL
SIGNAL P. W. B.
2L COMB FILTER PACK
(AP52)
TILT
V6-A68FT
Y C VIDEO
C VIDEO
Y
A / V SW
PinP VIDEO
HIFI AMP
TERMINAL P. W. B.
VI/SV1/V2
A1/A2
MONITOR OUTPUT
HIFI OUTPUT
V M
PinP UNIT
SYNC CHIP CLAMP
V SYNC SEP
NOTCH FILTER
Y1
TO CPT P. W. B.
PinP R/G/B
V SYNC
H SYNC
OSD R/G/B
Y
C
R G B B
VIDEO/CHROMA/DEF.
V. DRIVE
H. DRIVE
TO DEFLECTION
AUDIO OUTPUT (FRONT)
MTS DECORDER
AUDIO CONTROL (F)
SP MATRIX
SP. TERMINAL
SP TERMINAL P. W. B.
CPT P. W. B.
RED VIDEO OUTPUT
GREEN VIDEO OUTPUT
BLUE VIDEO OUTPUT
Y OUTPUT
BEAM ALIGNMENT AND BEAMFOCUS MAGNET VM COIL
CY DY
R
G
B
TRANS FORMER T901
RECTIFIER
STAND-BY +12V
POWER SUPPLY/ DEFLECTION P. W. B.
NOISE FILTER
AC INPUT
RELAY S901
RECTIFIER
SWITCHING CIRCUIT I901, I931
I903 2501-1
I904 SE115
+B
SIGNAL
+115V
+11V
+7V
AUDIO
+26V
CONVER
+27V
+12V
-27V
-12V
T902
CONVER CORRECTION SIGNAL GEN. IT01
ADJUST CIRCUIT
H. SIZE, V. SIZE
AMP IT02
AMP IT03
AMP IT04
AMP IT05
ANALOG CONV. (AP52)
CONVERGENCE CORRECTION
VER. OUT I601 LA7838
H. SIZE SIDE-PIN
H. LIN CONTROL
HOR. DRIVE Q701
HOR. OUT Q777 (2SC4589)
FBT T702
DY
12KV
30KV
CY
FOCUS
FOCUS PACK
SCREEN
CONVERGENCE OUT IK04 STK4274 R
CONVERGENCE OUT IK05 STK4274 G
CONVERGENCE OUT IK06 STK4274 B
HOR. DYNAMIC FOCUS
VER. DYNAMIC FOCUS
DYNAMIC FOCUS OUTPUT QF01
R/G/B

BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
VSYNC
HSYNC
SYNC
ON/OFF
RESET
I004 M51951BSL
I001 TVμP
I002 UPD4052BC
MPX
I003 E²PROM
I005 HD74HC32P
TO SD CONNECTOR.
TO V/C/J.
TO PinP UNIT TERMINAL, AUDIO 3LIN AND VM.
TO FE.
PFJ
7P-EH
KEY-IN0
POWER
GND
EE
A+5V
IR-IN
9V
SC4
SC3
SC1
SC2
VDRV
TVONOFF
HVPRO
A+12V
AC
9V
DATA
CLOCK
LOAD1
YS(VM)
HALFTONE
PBLK
ACOLOR
PMODE
NR
OSDR
OSDG
OSDB
CONTRAST
COLOR
TINT
SHARPNESS
BRIGHTNESS
NOTCH
NOISE
SYNC
VMUTE
VOUT
SCONT
SDA1
SCL1
BPF
MUTE
SDA2
SCL2
FELCK
FEEN
FEDA
FECLK
AFC
V-MUTE
+5VReg
MEMORY INITIAL
AP52 SIGNAL P.W.B. (1/3)

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
I001	1	0.1
	2	5.1
	3	5.1
	4	5.2
	5	3.2
	6	0.5
	7	3.3
	8	0
	9	0
	10	0
	11	2.5
	12	0
	13	2.6
	14	2.4
	15	2.4
	16	2.6
	17	2.5
	18	7.3
	19	8.9
	20	8.8
	21	0
	22	5.2
	23	0
	24	1.3
	25	1.1
	26	2.0
	27	0
	28	5.0
	29	5.0
	30	0.2
	31	0.1
	32	5.2

Circuit No.	Pin No.	Voltage VDC
I001	33	5.0
	34	5.0
	35	5.1
	36	0
	37	5.2
	38	0
	39	4.8
	40	0.1
	41	0
	42	0
	43	0
	44	0
	45	8.1
	46	0
	47	0
	48	0
	49	0
	50	0
	51	0
	52	5.2
	53	5.2
	54	5.2
	55	5.0
	56	0
	57	0
	58	5.2
	59	5.1
	60	5.1
	61	5.2
	62	2.4
	63	2.2
	64	0

Circuit No.	Pin No.	Voltage VDC
I002	1	0
	2	3.8
	3	2.4
	4	2.4
	5	0
	6	0
	7	0
	8	0
	9	5.2
	10	5.2
	11	0.5
	12	0.3
	13	0.5
	14	0.1
	15	0.1
	16	5.2

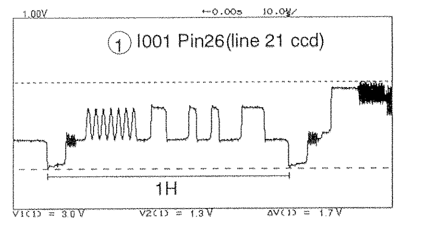
Circuit No.	Pin No.	Voltage VDC
I003	1	0
	2	0
	3	0
	4	0
	5	5.1
	6	5.1
	7	0
	8	5.2

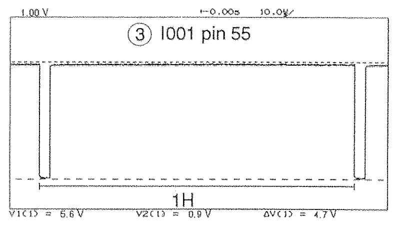
Circuit No.	Pin No.	Voltage VDC
I004	1	5.2
	2	0
	3	5.2

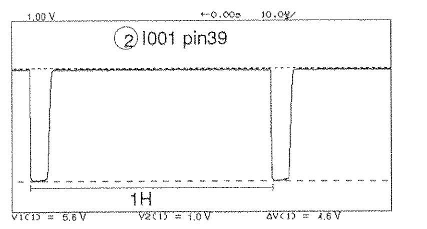
Circuit No.	Pin No.	Voltage VDC
I005	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
	8	0
	9	0
	10	0
	11	0
	12	0
	13	0
	14	5.2

Circuit No.	Pin No.	Voltage VDC
Q001	B	0.1
	C	5.0
	E	0
Q002	B	0.6
	C	2.5
	E	0.2
Q003	B	0.4
	C	2.5
	E	0.2
Q004	B	0.7
	C	0.1
	E	0
Q005	B	0
	C	4.8
	E	0
Q006	B	0.7
	C	0.1
	E	0
Q007	B	5.3
	C	0.8
	E	5.2
Q009	B	0
	C	5.2
	E	0

Circuit No.	Pin No.	Voltage VDC
Q011	B	0
	C	5.2
	E	0
Q014	B	0
	C	5.0
	E	0
Q015	B	5.9
	C	12.4
	E	5.2
Q016	B	12.4
	C	0
	E	12.4
Q017	B	0
	C	12.3
	E	0
Q021	B	3.9
	C	9.1
	E	3.2
Q023	B	0.6
	C	0.2
	E	0
Q024	B	0
	C	9.1
	E	0

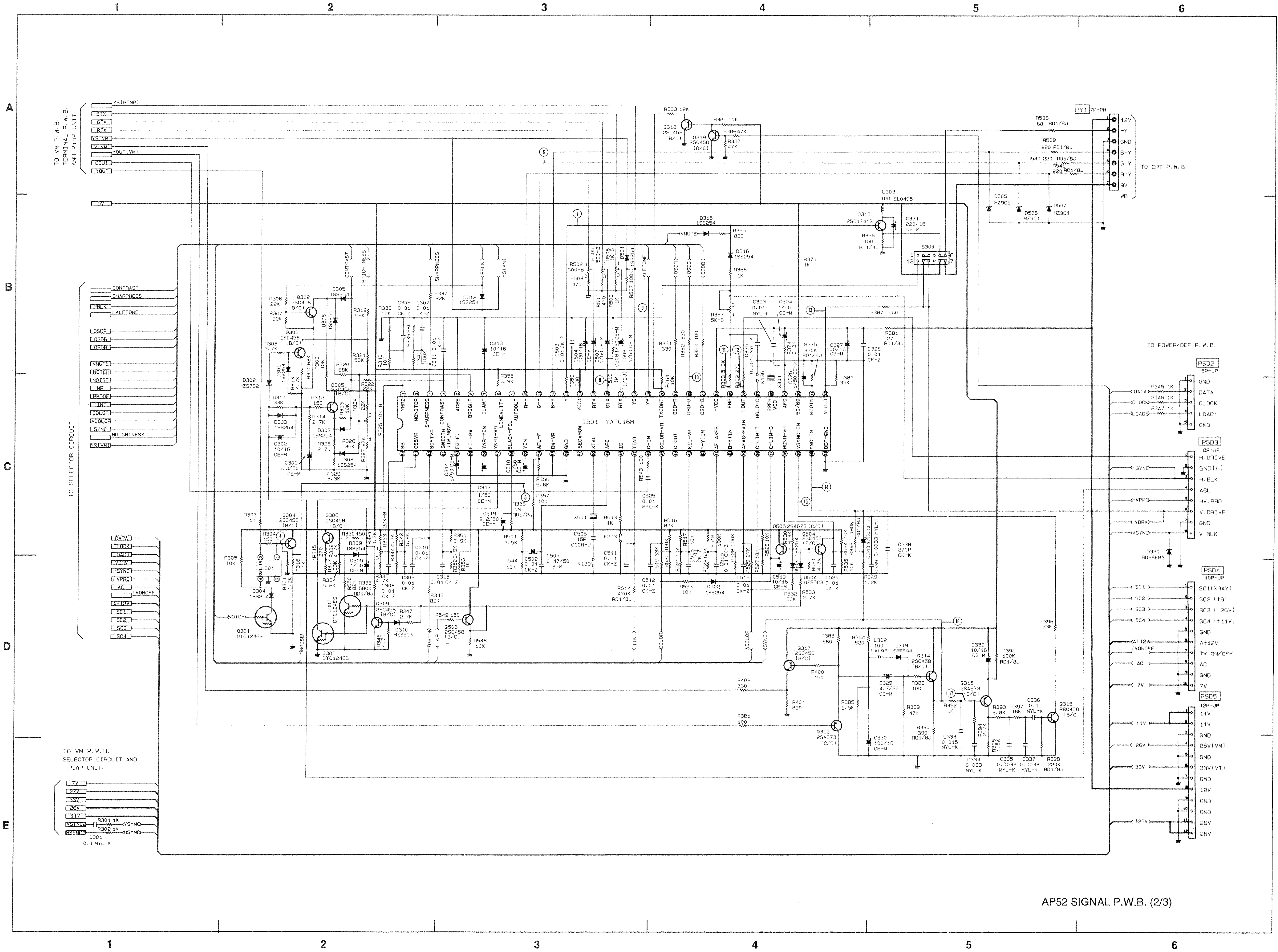

① I001 Pin26(line 21 ccd)


③ I001 pin 55


② I001 pin39

BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
TO VM P.W.B. TERMINAL P.W.B. AND PinP UNIT
YS(PINP)
BTX
GTX
RTX
YS(VM)
V(VM)
YOUT(VM)
COUT
YOUT
9V
CONTRAST
SHARPNESS
FBLK
HALFTONE
OSDR
OSDG
OSDB
VMUTE
NOTCH
NOISE
NB
PMODE
TINT
COLOR
ACOLOR
SYNC
BRIGHTNESS
YS(VM)
TO SELECTOR CIRCUIT
DATA
CLOCK
LOAD1
VDRV
HSYNC
HVPRO
AC
TVONOFF
A(12V
SC1
SC2
SC3
SC4
TO VM P.W.B. SELECTOR CIRCUIT AND PinP UNIT.
7V
27V
33V
26V
11V
VSYNC
HSYNC
I501 YAT016H
PY1 7P-PH
12V
-Y
GND
B-Y
G-Y
R-Y
9V
TO CPT P.W.B.
TO POWER/DEF P.W.B.
PSD2 5P-JP
GND
DATA
CLOCK
LOAD1
GND
PSD3 8P-JP
H. DRIVE
GND(H)
H. BLK
ABL
HV. PRO
V. DRIVE
GND
V. BLK
PSD4 10P-JP
SC1(XRAY)
SC2 (+B)
SC3 (26V)
SC4 (+11V)
GND
A+12V
TV ON/OFF
AC
GND
7V
PSD5 12P-JP
11V
11V
GND
26V(VM)
GND
33V(VT)
GND
12V
GND
GND
26V
26V
S301
L303 10D EL0405
Q313 2SC1741S
Q318 2SC458 (B/C)
Q319 2SC458 (B/C)
Q301 DTC124ES
Q302 2SC458 (B/C)
Q303 2SC458 (B/C)
Q304 2SC458 (B/C)
Q305 2SC458 (B/C)
Q306 2SC458 (B/C)
Q307 DTC124ES
Q308 DTC124ES
Q309 2SC458 (B/C)
Q312 2SA673 (C/D)
Q314 2SC458 (B/C)
Q315 2SA673 (C/D)
Q316 2SC458 (B/C)
Q317 2SC458 (B/C)
Q504 2SC458 (B/C)
Q505 2SA673 (C/D)
Q506 2SC458 (B/C)
X501
K189
K203
D505 HZ9C1
D506 HZ9C1
D507 HZ9C1
D320 RD36EB3
D302 HZS7B2

AP52 SIGNAL P.W.B. (2/3)

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

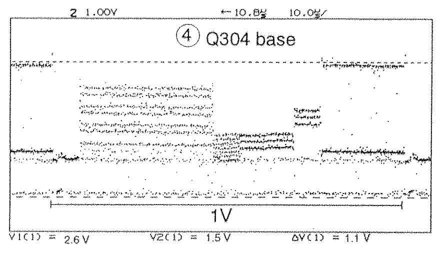
Circuit No.	Pin No.	Voltage VDC
I501	1	0
	2	0
	3	4.2
	4	7.1
	5	0
	6	4.6
	7	6.9
	8	8.9
	9	0.1
	10	5.1
	11	5.2
	12	5.3
	13	4.6
	14	9.1
	15	3.1
	16	3.1
	17	3.1
	18	0
	19	0
	20	4.9
	21	0
	22	0
	23	0
	24	7.8
	25	1.3
	26	0.8
	27	0
	28	5.0
	29	5.5
	30	8.8
	31	7.6
	32	4.5

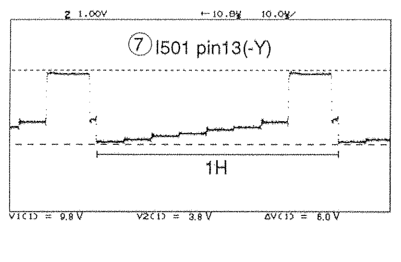
Circuit No.	Pin No.	Voltage VDC
I501	33	0
	34	7.0
	35	6.5
	36	0
	37	4.2
	38	4.0
	39	6.5
	40	1.3
	41	3.6
	42	1.3
	43	4.2
	44	6.5
	45	4.6
	46	3.2
	47	4.5
	48	0.7
	49	5.9
	50	5.5
	51	1.4
	52	0
	53	0
	54	3.3
	55	3.8
	56	6.1
	57	4.4
	58	3.8
	59	0
	60	4.3
	61	4.1
	62	6.0
	63	3.7
	64	5.5

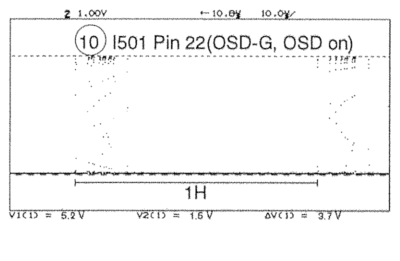
Circuit No.	Pin No.	Voltage VDC
Q301	B	0
	C	8.5
	E	0
Q302	B	0
	C	9.1
	E	0
Q303	B	1.0
	C	4.2
	E	0.5
Q304	B	2.0
	C	9.0
	E	1.3
Q305	B	8.1
	C	9.1
	E	7.4
Q306	B	4.4
	C	9.1
	E	3.8
Q307	B	8.1
	C	4.8
	E	0
Q308	B	8.1
	C	0
	E	0

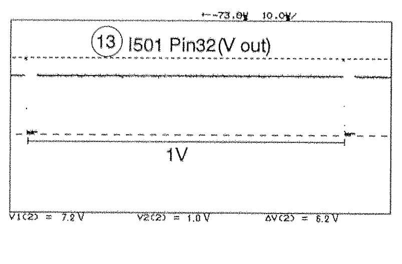
Circuit No.	Pin No.	Voltage VDC
Q309	B	0.7
	C	0
	E	0
Q312	B	4.6
	C	0
	E	5.2
Q313	B	4.7
	C	9.0
	E	4.0
Q314	B	6.0
	C	9.1
	E	5.3
Q315	B	5.3
	C	0
	E	5.2
Q316	B	-0.2
	C	6.4
	E	0
Q318	B	0.7
	C	0
	E	0
Q319	B	0
	C	0.7
	E	0

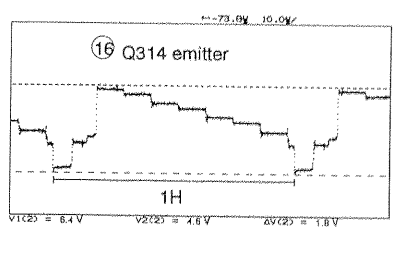
Circuit No.	Pin No.	Voltage VDC
Q504	B	0.7
	C	0
	E	0
Q505	B	9.0
	C	4.2
	E	9.1
Q506	B	8.8
	C	9.1
	E	8.1

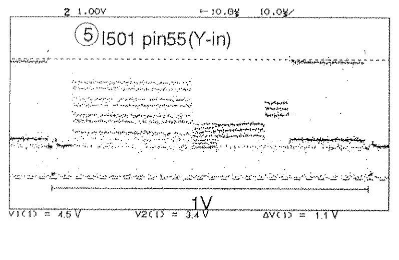

④ Q304 base

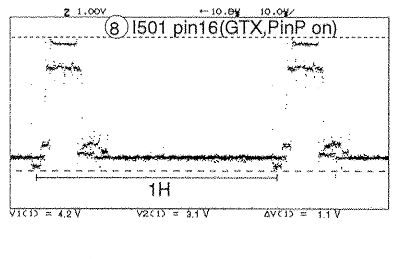

⑦ I501 pin13(-Y)

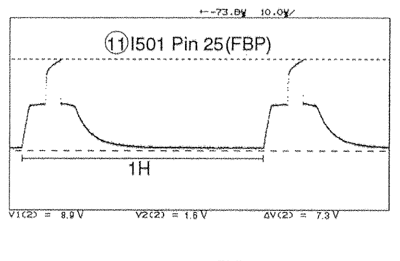

⑩ I501 Pin 22(OSD-G, OSD on)

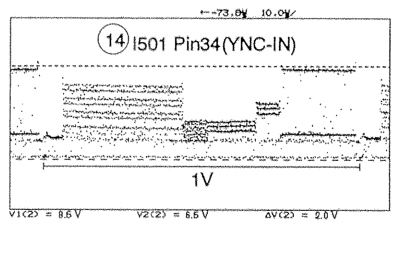

⑬ I501 Pin32(V out)

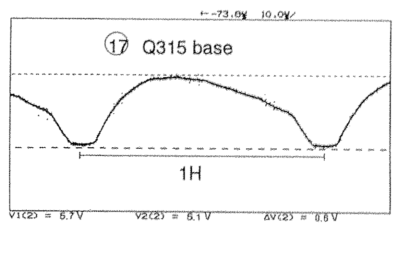

⑯ Q314 emitter

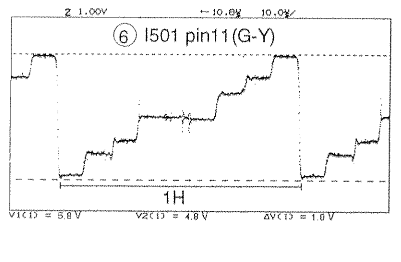

⑤ I501 pin55(Y-in)

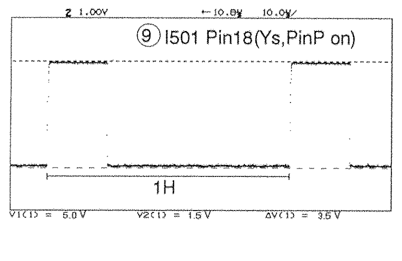

⑧ I501 pin16(GTX,PinP on)

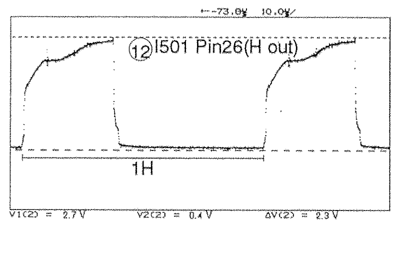

⑪ I501 Pin 25(FBP)

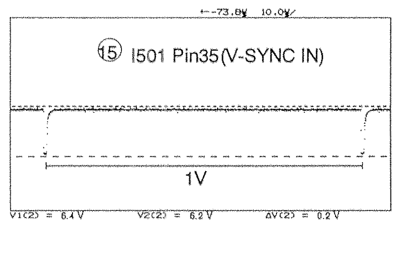

⑭ I501 Pin34(YNC-IN)


⑰ Q315 base


⑥ I501 pin11(G-Y)


⑨ I501 Pin18(Ys,PinP on)


⑫ I501 Pin26(H out)


⑮ I501 Pin35(V-SYNC IN)

BASIC CIRCUIT DIAGRAM

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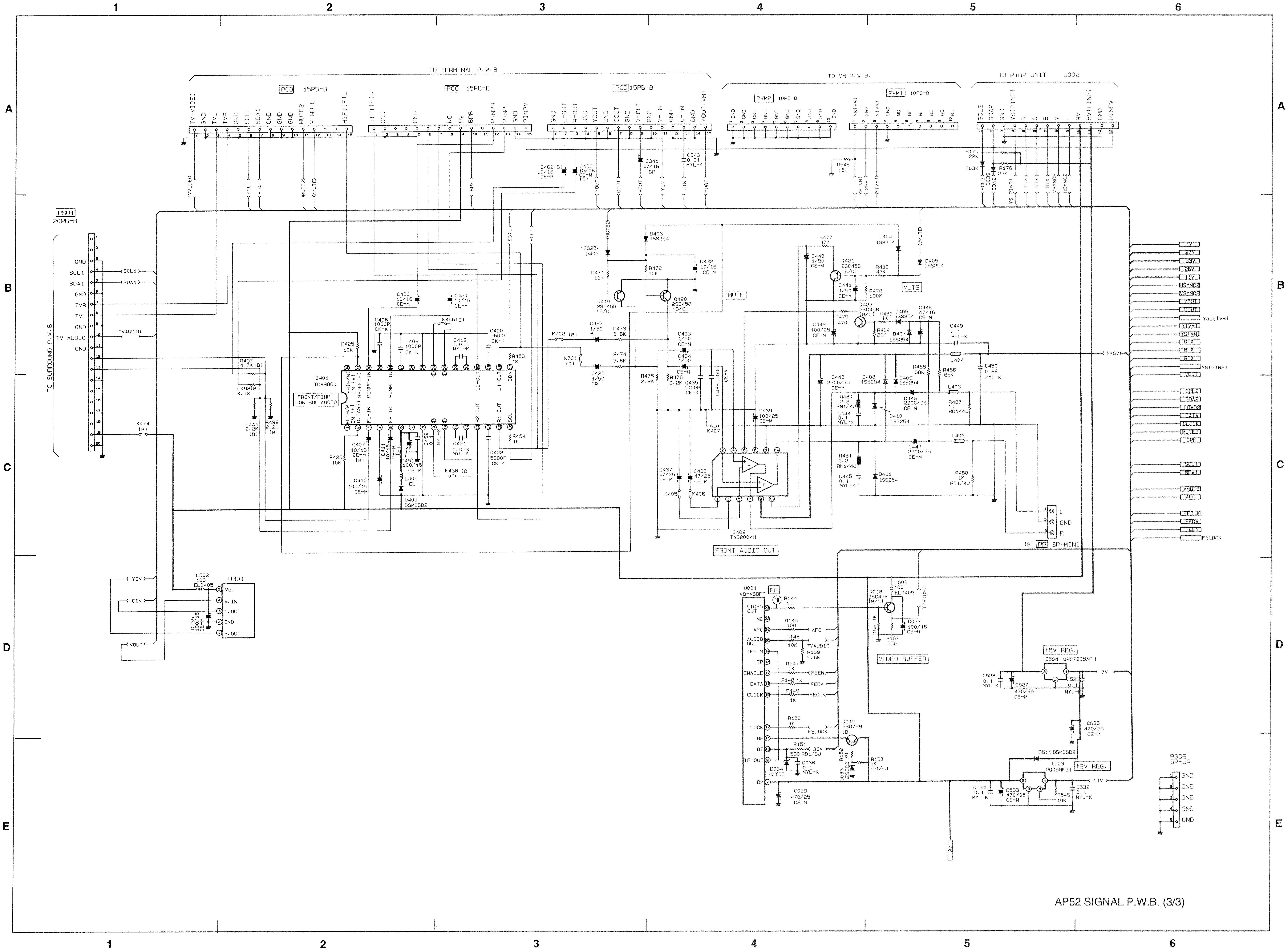

1
2
3
4
5
6
A
B
C
D
E
TO TERMINAL P.W.B
PCB 15PB-B
PCC 15PB-B
PCD 15PB-B
TO VM P.W.B.
PVM2 10PB-B
PVM1 10PB-B
TO PinP UNIT U002
PSU1 20PB-B
TO SURROUND P.W.B
GND
SCL1
SDA1
TVR
TVL
TV AUDIO
I401 TDA9860
FRONT/PINP CONTROL AUDIO
MUTE
Q419 2SC458 (B/C)
Q420 2SC458 (B/C)
Q421 2SC458 (B/C)
Q422 2SC458 (B/C)
I402 TA8200AH
FRONT AUDIO OUT
PP 3P-MINI
L
GND
R
U301
VCC
V.IN
C.OUT
GND
Y.OUT
YIN
CIN
VOUT
U001 VB-A68F
FE
VIDEO OUT
NC
AFC
AUDIO OUT
IF-IN
TP
ENABLE
DATA
CLOCK
LOCK
BP
BT
IF-OUT
BM
Q018 2SC458 (B/C)
VIDEO BUFFER
Q019 2SD789 (B)
+5V REG.
I504 uPC7805AFH
+9V REG.
I503 PQ09RF21
PSD6 5P-JP
7V
27V
33V
26V
11V
HSYNC2
VSYNC2
YOUT
COUT
Yout(VM)
Y(VM)
YS(VM)
GTX
BTX
RTX
YS(PINP)
VOUT
SCL2
SDA2
LOAD2
DATA
CLOCK
MUTE2
BPF
SCL1
SDA1
VMUTE
AFC
FECLK
FEDA
FEEN
FELOCK
AP52 SIGNAL P.W.B. (3/3)

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

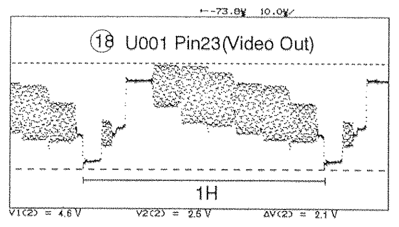
Circuit No.	Pin No.	Voltage VDC
I401	1	4.1
	2	0.2
	3	4.1
	4	8.2
	5	4.1
	6	8.3
	7	4.2
	8	0
	9	4.2
	10	4.2
	11	4.2
	12	4.2
	13	4.2
	14	4.2
	15	4.2
	16	5.1
	17	5.1
	18	4.2
	19	4.2
	20	4.2
	21	4.2
	22	4.2
	23	4.2
	24	4.2
	25	0
	26	4.2
	27	4.2
	28	4.2
	29	4.2
	30	4.2
	31	0.2
	32	4.2

Circuit No.	Pin No.	Voltage VDC
I402	1	1.6
	2	0
	3	0
	4	0
	5	1.6
	6	9.1
	7	12.5
	8	5.0
	9	27.1
	10	0
	11	4.1
	12	12.3

Circuit No.	Pin No.	Voltage VDC
I503	1	12.7
	2	9.1
	3	0
	4	12.7

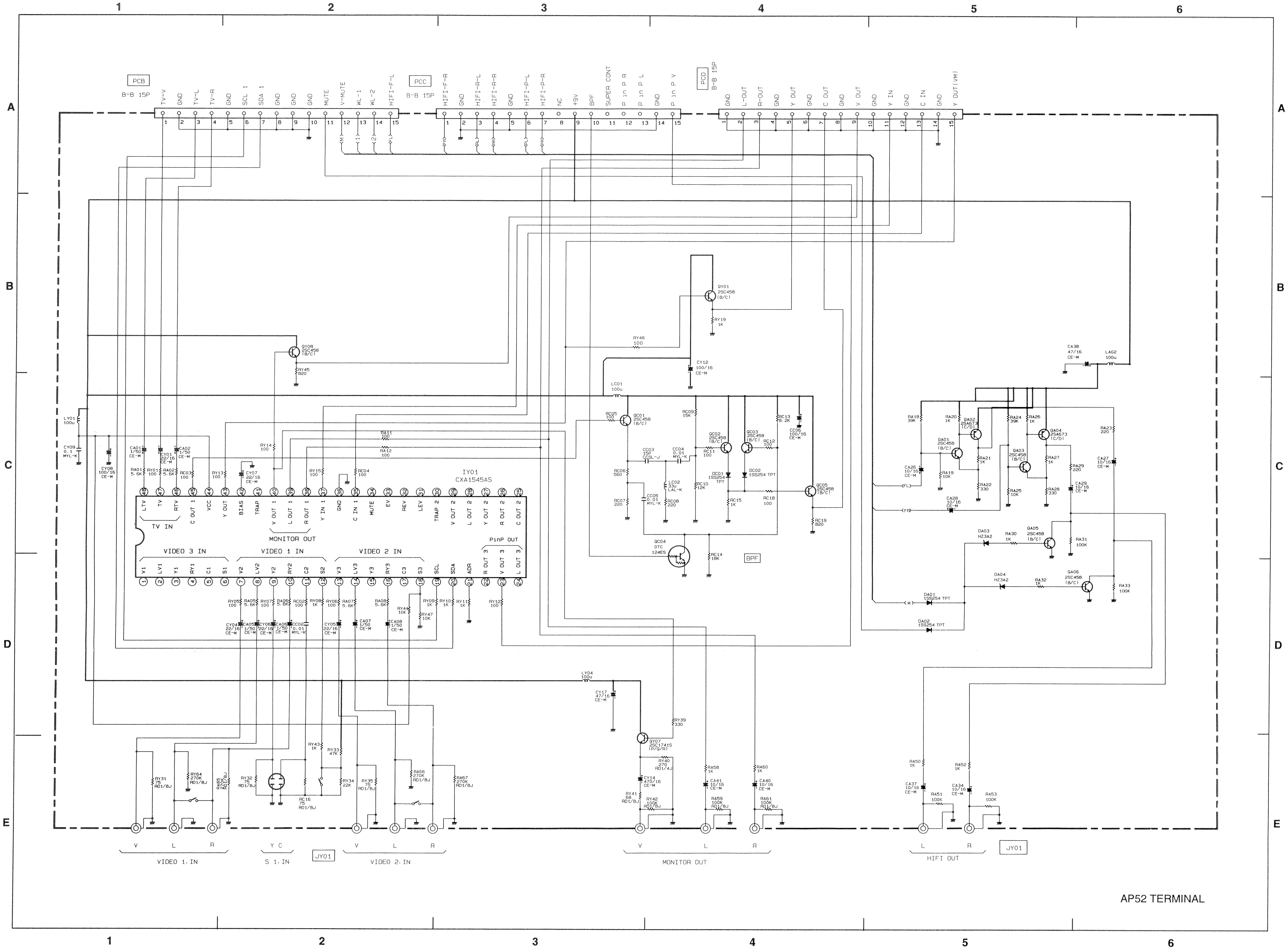
Circuit No.	Pin No.	Voltage VDC
I504	1	8.3
	2	0
	3	4.9

Circuit No.	Pin No.	Voltage VDC
Q419	B	0.2
	C	0
	E	0
Q420	B	0.2
	C	0
	E	0
Q421	B	0
	C	4.1
	E	0
Q422	B	0
	C	9.1
	E	0
Q018	B	1.7
	C	9.0
	E	1.0
Q019	B	6.2
	C	9.0
	E	5.6



BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
PCB
B-B 15P
TV-V
GND
TV-L
TV-R
GND
SCL 1
SDA 1
GND
GND
GND
MUTE
V-MUTE
WL-1
WL-2
HIFI-F-L
PCC
B-B 15P
HIFI-F-R
GND
HIFI-R-L
HIFI-R-R
GND
HIFI-P-L
HIFI-P-R
NC
+9V
BPF
SUPER CONT
P in P R
P in P L
GND
P in P V
PCD
B-B 15P
GND
L-OUT
R-OUT
GND
Y OUT
GND
C OUT
GND
V OUT
GND
Y IN
GND
C IN
GND
Y OUT(VM)
IY01
CXA1545AS
TV IN
MONITOR OUT
VIDEO 3 IN
VIDEO 1 IN
VIDEO 2 IN
PinP OUT
QY01 2SC458 (B/C)
QY07 2SC1741S (R/Q/R)
QY08 2SC458 (B/C)
QC01 2SC458 (B/C)
QC02 2SC458 (B/C)
QC03 2SC458 (B/C)
QC04 DTC 124ES
QC05 2SC458 (B/C)
QA01 2SC458 (B/C)
QA02 2SA673 (C/D)
QA03 2SC458 (B/C)
QA04 2SA673 (C/D)
QA05 2SC458 (B/C)
QA06 2SC458 (B/C)
BPF
V
L
R
VIDEO 1. IN
Y C
S 1. IN
JY01
V
L
R
VIDEO 2. IN
V
L
R
MONITOR OUT
L
R
HIFI OUT
JY01
AP52 TERMINAL

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IY01	1	4.7
	2	4.7
	3	4.7
	4	4.7
	5	4.7
	6	2.5
	7	4.7
	8	4.7
	9	4.7
	10	4.7
	11	4.7
	12	2.5
	13	4.7
	14	4.7
	15	4.7
	16	4.7
	17	4.7
	18	4.3
	19	5.1
	20	5.1
	21	0
	22	4.8
	23	4.6
	24	4.8

Circuit No.	Pin No.	Voltage VDC
IY01	25	4.7
	26	4.8
	27	4.7
	28	4.8
	29	4.7
	30	4.7
	31	4.7
	32	4.7
	33	4.7
	34	0
	35	4.7
	36	0
	37	4.7
	38	4.8
	39	4.8
	40	4.6
	41	4.7
	42	4.7
	43	4.6
	44	9.0
	45	4.6
	46	4.7
	47	4.7
	48	4.7

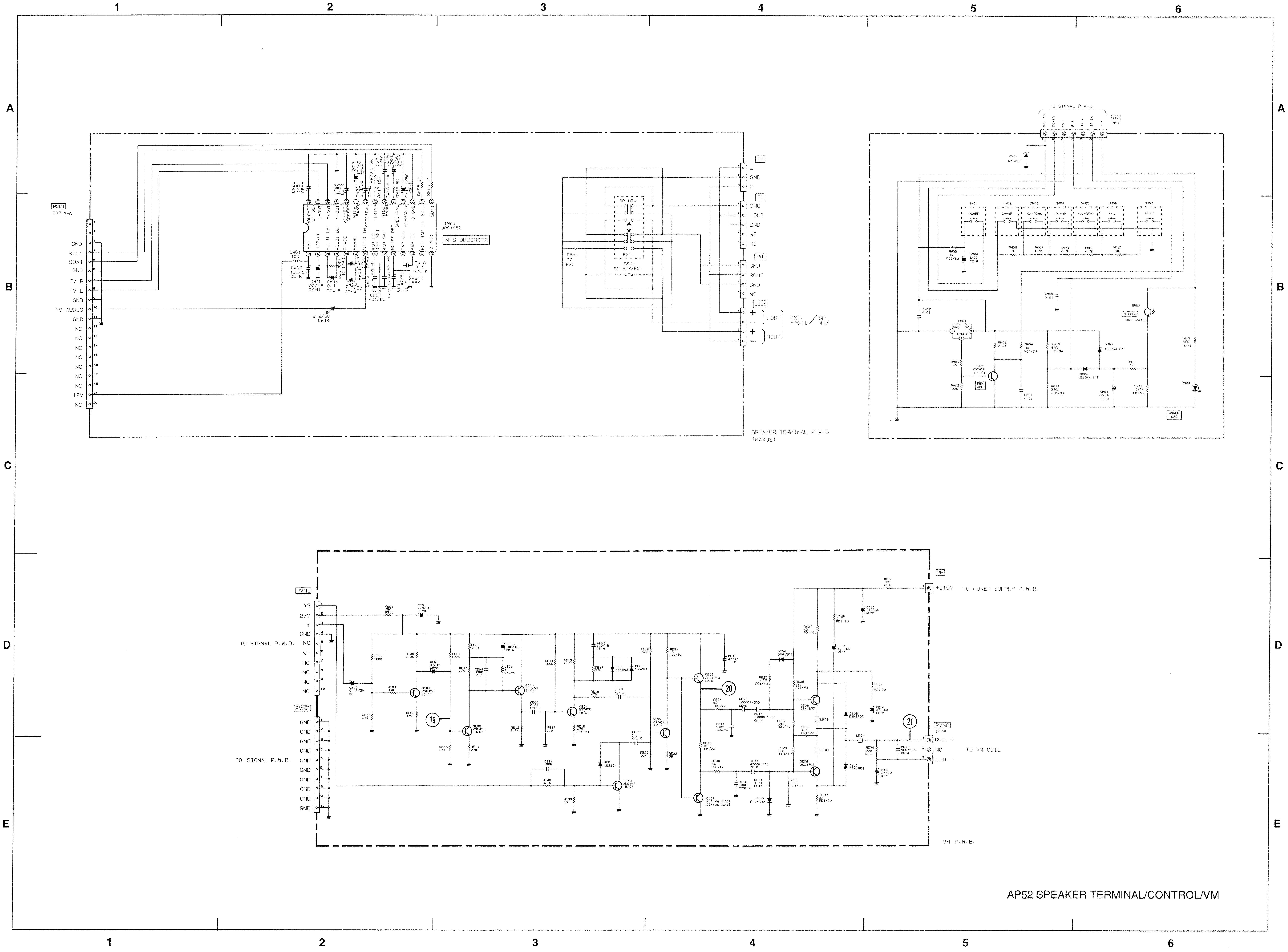
Circuit No.	Pin No.	Voltage VDC
QA01	B	1.8
	C	8.4
	E	1.2
QA02	B	8.4
	C	4.1
	E	9.0
QA03	B	1.8
	C	8.4
	E	1.2
QA04	B	8.4
	C	4.0
	E	9.0
QA05	B	0
	C	0
	E	0
QA06	B	0
	C	0
	E	0

Circuit No.	Pin No.	Voltage VDC
QC01	B	4.6
	C	9.0
	E	3.9
QC02	B	3.9
	C	9.0
	E	3.2
QC03	B	0
	C	9.0
	E	0.1
QC04	B	5.0
	C	0
	E	0
QC05	B	2.6
	C	9.0
	E	1.9

Circuit No.	Pin No.	Voltage VDC
QY01	B	5.1
	C	9.1
	E	4.4
QY07	B	4.6
	C	9.0
	E	4.0
QY08	B	4.6
	C	9.0
	E	3.9

BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
PSU1
20P B-B
GND
SCL1
SDA1
GND
TV R
TV L
GND
TV AUDIO
GND
NC
+9V
LW01
100
CW09
100/16
CE-M
CW10
22/16
CE-M
CW11
0.1
MYL-K
CW13
4.7/50
CE-M
BP
2.2/50
CW14
RW88
680K
RD1/8J
CW18
0.1
MYL-K
RW14
68K
IW01
uPC1852
MTS DECORDER
MONO-DC OFFSET
L-OUT
R-OUT
N-OUT
VCA-DC OFFSET
WIDE BAND
SPECTRAL
TIMING
ENPHASIS
D-GND
SCL1
SDA1
Vcc
1/2Vcc
PILOT DET
PHASE
AUDIO IN
SAP DC OFF SET
SAP DET
NOISE DET
SAP OUT
SAP IN
EXT SAP IN
A-GND
CW25
1/50
CE-M
CW24
CW23
10/16
CE-M
CW22
RW70 1.6K
RW17 15K
RW16 5.1K
RW15 3K
CW19 1/50
CE-M
RW85 1K
RW86 1K
RSA1
27
RS3
SP MTX
EXT.
SS01
SP MTX/EXT
PP
L
GND
R
PL
GND
LOUT
GND
NC
NC
PR
GND
ROUT
GND
NC
JS01
LOUT
ROUT
EXT. Front / SP MTX
SPEAKER TERMINAL P.W.B
(MAXUS)
TO SIGNAL P.W.B.
PFJ
7P-E
KEY IN
POWER
GND
E.E
A+5V
IR IN
+9V
DM04
HZS12C3
SM01
POWER
SM02
CH-UP
SM03
CH-DOWN
SM04
VOL-UP
SM05
VOL-DOWN
SM06
AVX
SM07
MENU
RM05
1K
PD1/8J
CM03
1/50
CE-M
RM06
1K
RM07
1.5K
RM08
2.7K
RM09
4.7K
RM15
10K
CM05
0.01
CM02
0.01
HM01
GND 5V
REMOTE
RM03
2.2K
RM04
1K
RD1/8J
RM10
470K
RD1/8J
DM01
1SS254 TPT
QM02
DIMMER
PRT-38PT3F
RM13
560
(1/4)
RM01
1K
QM01
2SC458
(B/C/D)
REM. AMP.
RM02
22K
CM04
0.01
DM02
1SS254 TPT
RM11
1K
RM14
330K
RD1/8J
CM01
22/16
EC-M
RM12
330K
RD1/8J
DM03
POWER LED
PVM1
YS
27V
Y
GND
NC
TO SIGNAL P.W.B.
PVM2
GND
TO SIGNAL P.W.B.
19
20
21
PB
+115V TO POWER SUPPLY P.W.B.
PVMC
COIL +
NC
COIL -
TO VM COIL
VM P.W.B.

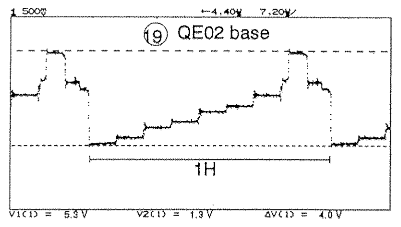
AP52 SPEAKER TERMINAL/CONTROL/VM

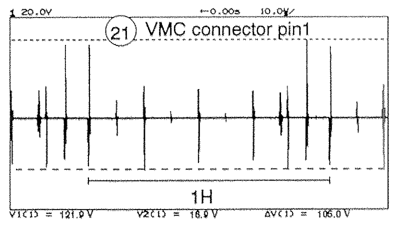
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

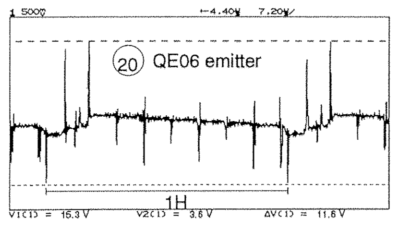
Circuit No.	Pin No.	Voltage VDC
IW01	1	9.0
	2	4.5
	3	4.5
	4	4.6
	5	4.6
	6	4.6
	7	4.5
	8	4.5
	9	5.6
	10	0.1
	11	3.4
	12	4.5
	13	4.5
	14	0
	15	5.1
	16	5.1
	17	0
	18	4.7
	19	4.6
	20	4.7
	21	1.2
	22	5.1
	23	5.2
	24	4.5
	25	4.6
	26	4.6
	27	4.6
	28	4.8

Circuit No.	Pin No.	Voltage VDC
QE01	B	2.8
	C	9.9
	E	2.2
QE02	B	2.6
	C	6.8
	E	1.9
QE03	B	6.8
	C	15.4
	E	6.1
QE04	B	2.4
	C	5.6
	E	1.7
QE05	B	1.1
	C	8.0
	E	0.4
QE06	B	7.9
	C	15.4
	E	8.0
QE07	B	8.0
	C	0
	E	8.0
QE08	B	112.4
	C	39.9
	E	112.5
QE09	B	0.2
	C	38.3
	E	0.2
QE10	B	0
	C	0
	E	0

Circuit No.	Pin No.	Voltage VDC
QM01	B	0.7
	C	0.1
	E	0
QM02	B	---
	C	1.6
	E	9.1


(19) QE02 base


(21) VMC connector pin1


(20) QE06 emitter

BASIC CIRCUIT DIAGRAM

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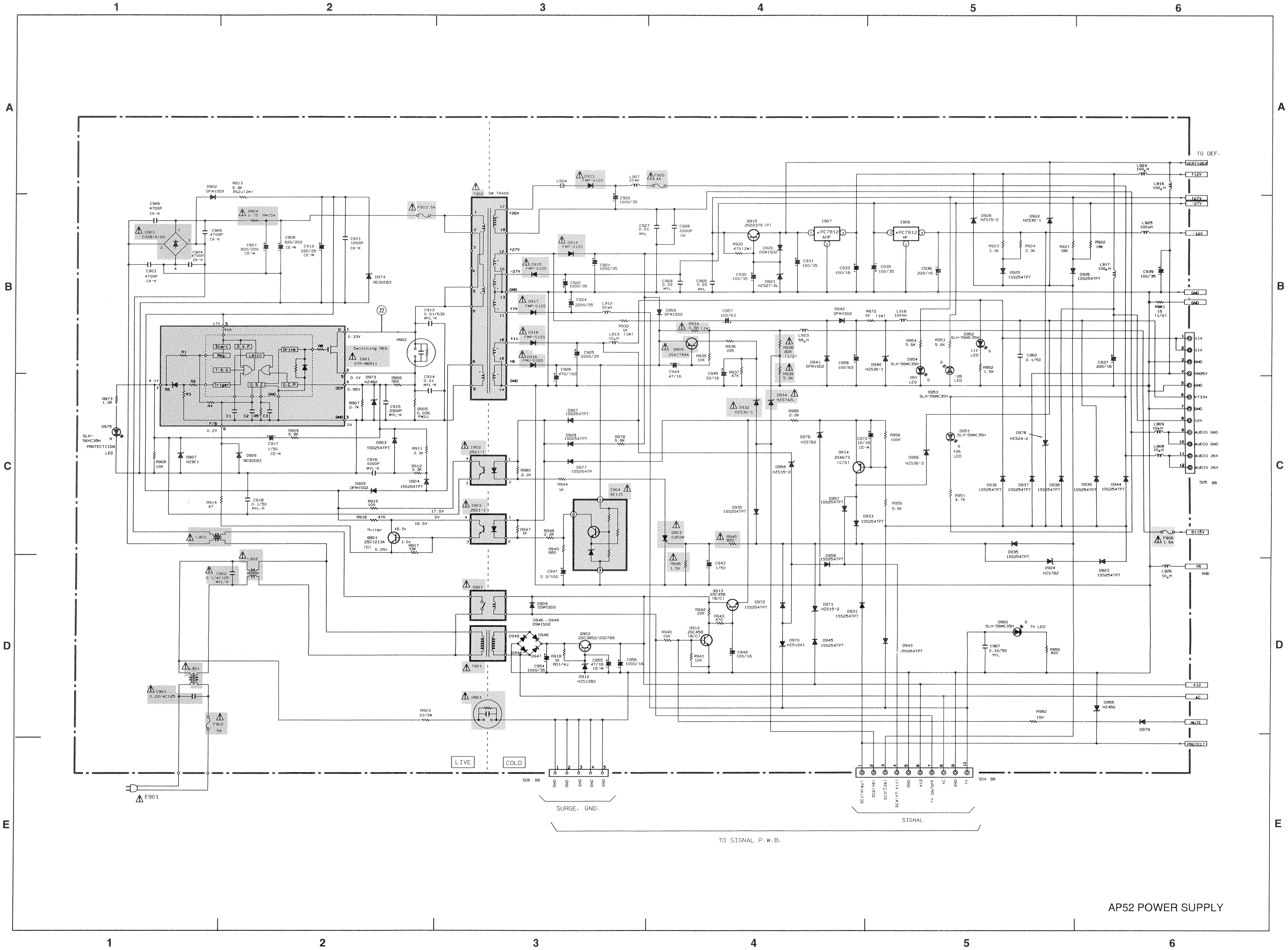

1
2
3
4
5
6
A
B
C
D
E
TO DEF.
VERT(+26V)
+12V
+27V
-27V
-12V
GND
T902 SW TRANS
I901 STR-M6511
Switching REG.
Start
O.V.P
Reg.
Latch
Drive
T.S.D
Triger
O.S.C
O.C.P
I907 μPC7812 AHF
I906 μPC7912 HF
I902 2501-1
I903 2501-1
I904 SE115
S901
T901
H901
F903 5A
F902 5A
F905 4A
F906 1.6A
D901 D3SB(A)60
SLH-56YC35H PROTECTION LED
11V LED
26V LED
-26 LED
+26 LED
7V LED
B115V
+B
A12
AC
MUTE
PROTECT
AUDIO GND
AUDIO 26V
VA26V
VT33V
S05 BB
S06 BB
S04 BB
LIVE
COLD
SURGE. GND.
SIGNAL
TO SIGNAL P.W.B.
E901

AP52 POWER SUPPLY

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
I901	1	1.33
	2	0.1
	3	0
	4	0.95
	5	17.0
	6	0.2
	7	4.1

Circuit No.	Pin No.	Voltage VDC
I902	1	20.0
	2	20.0
	3	17.0
	4	0

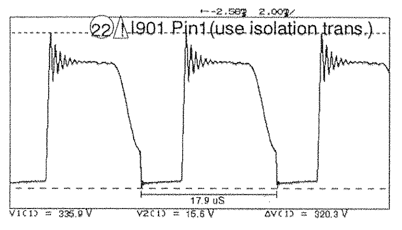
Circuit No.	Pin No.	Voltage VDC
I903	1	20.0
	2	19.1
	3	16.5
	4	1.0

Circuit No.	Pin No.	Voltage VDC
I904	1	115.1
	2	17.0
	3	0

Circuit No.	Pin No.	Voltage VDC
I906	1	0
	2	-26.8
	3	-12.2

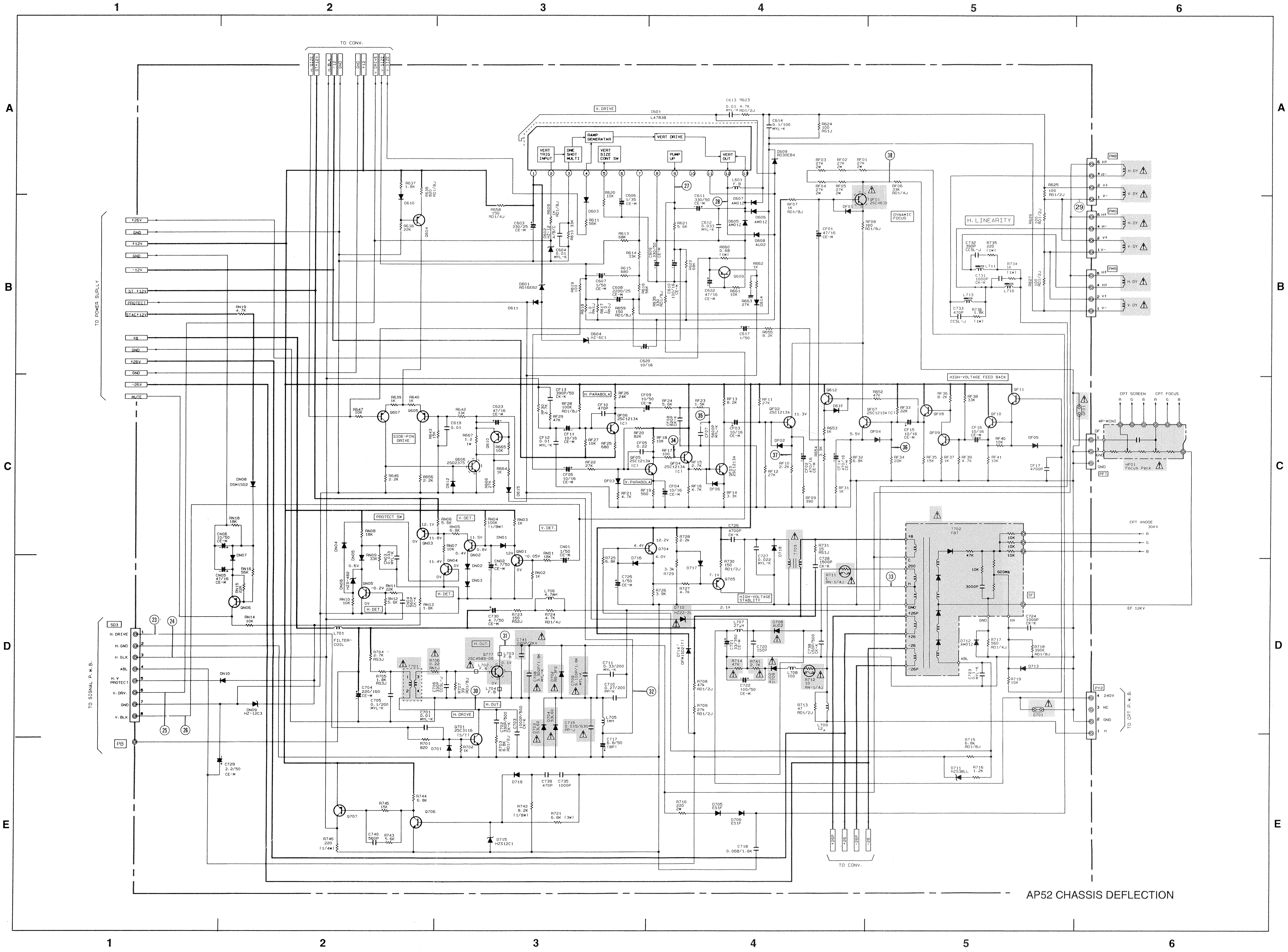
Circuit No.	Pin No.	Voltage VDC
I907	1	25.8
	2	0
	3	11.8

Circuit No.	Pin No.	Voltage VDC
Q901	B	1.0
	C	16.5
	E	0.25
Q902	B	12.9
	C	18.1
	E	12.4
Q903	K	0
	A	20.0
	G	0.1
Q909	B	65.0
	C	0.1
	E	115.1
Q912	B	0.1
	C	12.2
	E	0
Q913	B	0.1
	C	12.4
	E	11.6
Q914	B	6.7
	C	0
	E	7.0
Q915	B	26.5
	C	27.1
	E	25.9



BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
TO CONV.
TO POWER SUPPLY
+26V
GND
+12V
GND
-12V
ST +12V
PROTECT
STAC+12V
+B
GND
+26V
GND
-26V
MUTE
TO SIGNAL P.W.B.
SD3
H. DRIVE
H. GND
H. BLK
ABL
H.V. PROTECT
V. DRV.
GND
V. BLK
PB
I601 LA7838
VERT TRIG INPUT
ONE SHOT MULTI
VERT SIZE CONT SW
RAMP GENERATOR
VERT DRIVE
PUMP UP
VERT OUT
V. DRIVE
H. LINEARITY
DYNAMIC FOCUS
HIGH-VOLTAGE FEED BACK
SIDE-PIN DRIVE
V. PARABOLA
PROTECT SW
V. DET.
H. DET
H. DRIVE
H. OUT
HIGH-VOLTAGE STABILITY
T702 FBT
CPT SCREEN
CPT FOCUS
HFO1 Focus Pack
CPT ANODE 30KV
EF 12KV
TO CPT P.W.B.
245V
NC
GND
H
H. DY
V. DY
AP52 CHASSIS DEFLECTION

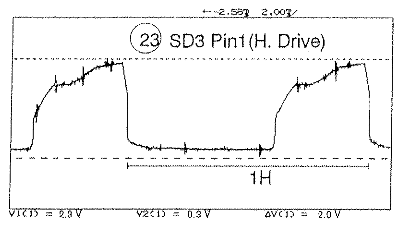
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

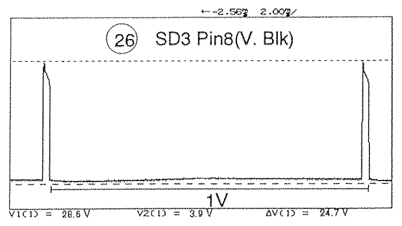
Circuit No.	Pin No.	Voltage VDC
I601	1	10.9
	2	4.4
	3	5.4
	4	5.6
	5	0
	6	5.1
	7	5.6
	8	25.6
	9	1.6
	10	1.3
	11	0
	12	13.0
	13	25.3

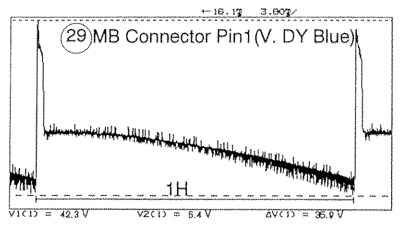
Circuit No.	Pin No.	Voltage VDC
Q604	B	10.3
	C	4.7
	E	10.9
Q605	B	3.6
	C	1.1
	E	4.2
Q606	B	0.5
	C	15.4
	E	0
Q607	B	3.7
	C	1.0
	E	4.2
Q609	B	0
	C	0
	E	25.9
Q610	B	15.4
	C	0
	E	15.7
Q612	B	4.2
	C	11.7
	E	3.6
Q701	B	0.3
	C	35.0
	E	0
Q704	B	4.4
	C	11.7
	E	3.8
Q705	B	6.0
	C	2.3
	E	6.7
Q706	B	-0.4
	C	9.5
	E	0

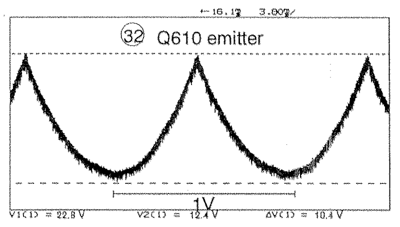
Circuit No.	Pin No.	Voltage VDC
Q707	B	12.7
	C	2.3
	E	11.7
Q777	B	0
	C	113.3
	E	0
QF01	B	11.6
	C	617.8
	E	11.1
QF02	B	5.9
	C	10.8
	E	5.6
QF03	B	2.5
	C	7.2
	E	1.9
QF04	B	3.1
	C	11.7
	E	2.5
QF05	B	1.1
	C	3.1
	E	0.5
QF06	B	-11.1
	C	-5.2
	E	-11.6
QF07	B	5.8
	C	10.8
	E	5.3
QF08	B	5.0
	C	11.7
	E	4.4
QF09	B	1.5
	C	5.0
	E	0.8

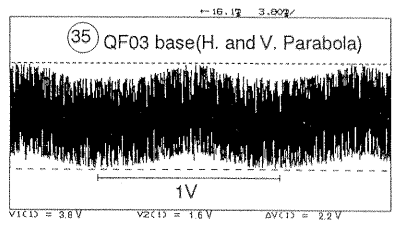
Circuit No.	Pin No.	Voltage VDC
QF10	B	10.5
	C	11.7
	E	9.9
QF11	B	10.9
	C	11.7
	E	10.5
QN01	B	0
	C	11.5
	E	0
QN02	B	0.9
	C	12.4
	E	0.5
QN03	B	12.4
	C	-0.5
	E	12.4
QN04	B	0
	C	12.4
	E	0
QN05	B	-0.2
	C	0.6
	E	0
QN06	B	10.0
	C	-0.5
	E	10.1

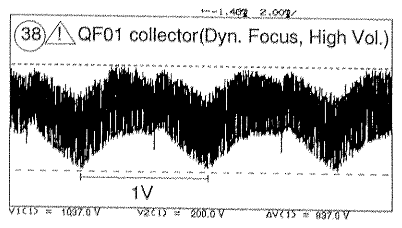

㉓ SD3 Pin1(H. Drive)

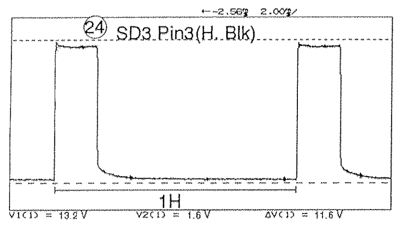

㉖ SD3 Pin8(V. Blk)

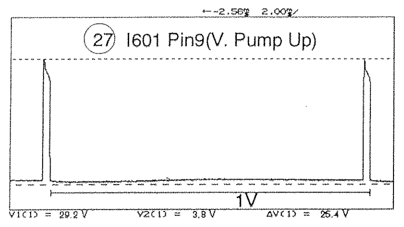

㉙ MB Connector Pin1(V. DY Blue)

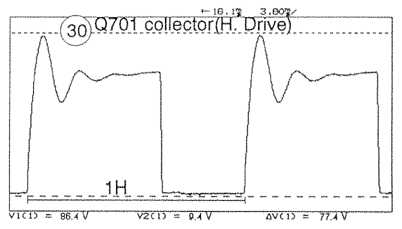

㉜ Q610 emitter

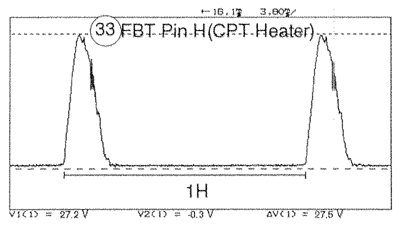

㉟ QF03 base(H. and V. Parabola)

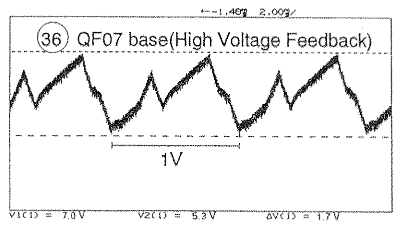

㊳ ⚠ QF01 collector(Dyn. Focus, High Vol.)

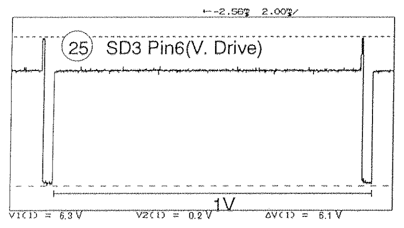

㉔ SD3 Pin3(H. Blk)

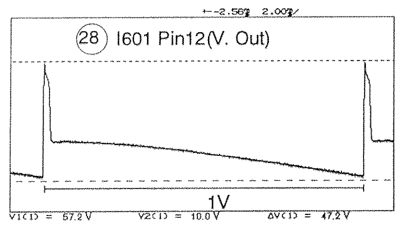

㉗ I601 Pin9(V. Pump Up)

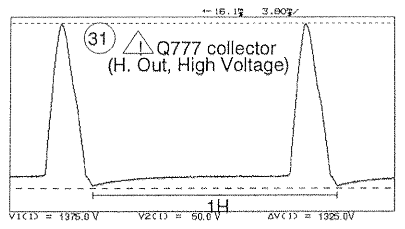

㉚ Q701 collector(H. Drive)

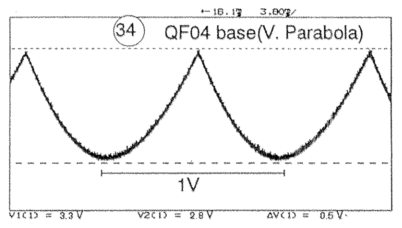

㉝ FBT Pin H(CPT Heater)

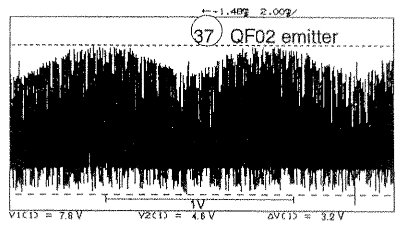

㊱ QF07 base(High Voltage Feedback)


㉕ SD3 Pin6(V. Drive)


㉘ I601 Pin12(V. Out)


㉛ ⚠ Q777 collector
(H. Out, High Voltage)


㉞ QF04 base(V. Parabola)


㊲ QF02 emitter

BASIC CIRCUIT DIAGRAM

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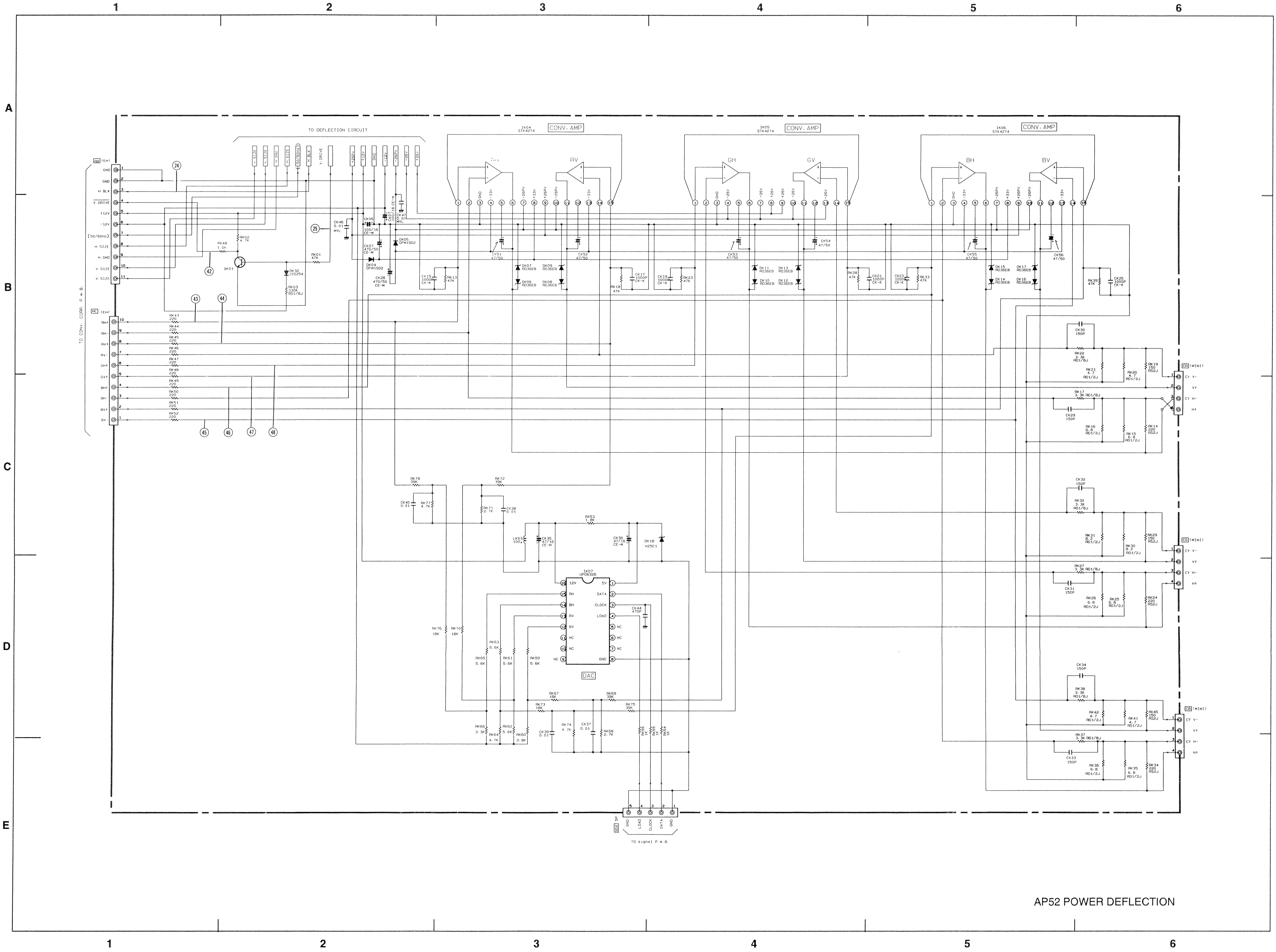

1
2
3
4
5
6
A
B
C
D
E
TO DEFLECTION CIRCUIT
V.SIZE
V.SIZE
H.GND
H.SIZE
(50/60Hz)
H.BLK
V.DRIVE
+26PV
+12V
GND
-12V
-26PV
-26V
+26V
RR (EH)
GND
GND
H.BLK
V.DRIVE
+12V
-12V
(50/60Hz)
H.SIZE
H.GND
V.SIZE
V.SIZE
RC (EH)
RH+
RH-
RV+
RV-
GH+
GV+
BH+
BH-
BV+
BV-
TO CONV. CORR. P.W.B.
IK04 STK4274
IK05 STK4274
IK06 STK4274
CONV. AMP
RH
RV
GH
GV
BH
BV
QK01
PKA8 1.0K
RK02 4.7K
RK01 47K
DK32 1SS254
RK03 330K RD1/8J
CK46 0.01 MYL
CK06 100/16 CE-M
CK27 470/50 CE-M
CK28 470/50 CE-M
DK04 DFM1SD2
DK05 DFM1SD2
CK47 0.01 MYL
IK07 UPD6326
DAC
12V
5V
DATA
CLOCK
LOAD
NC
GND
RK53 1.8K
CK35 47/16 CE-M
CK36 47/16 CE-M
DK18 HZ5C1
CK44 470P
SD2 5P
GND
LOAD
CLOCK
DATA
GND
TO signal P.W.B.
CY V-
CY V+
CY H-
CY H+
(24)
(25)
(42)
(43)
(44)
(45)
(46)
(47)
(48)
AP52 POWER DEFLECTION

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

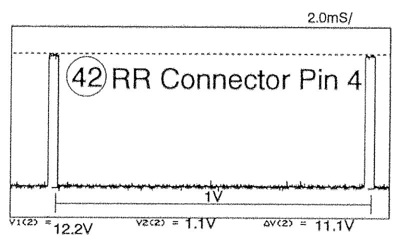
Circuit No.	Pin No.	Voltage VDC
IK04	1	-0.4
	2	-0.4
	3	0
	4	-33.0
	5	-22.3
	6	-0.3
	7	-26.7
	8	31.1
	9	27.0
	10	-26.7
	11	0
	12	-22.4
	13	-33.0
	14	0
	15	0

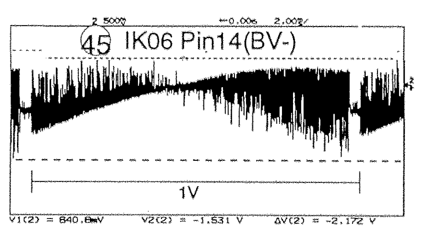
Circuit No.	Pin No.	Voltage VDC
IK05	1	-0.2
	2	-0.2
	3	0
	4	-33.0
	5	-19.7
	6	-0.2
	7	-26.8
	8	31.0
	9	27.0
	10	-26.8
	11	0
	12	-22.9
	13	-33.1
	14	0
	15	0

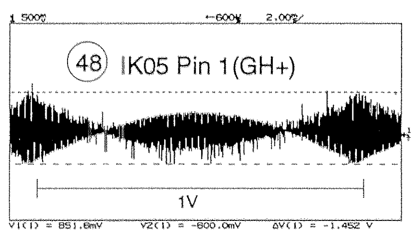
Circuit No.	Pin No.	Voltage VDC
IK06	1	-0.4
	2	-0.4
	3	0
	4	-33.0
	5	-22.6
	6	-0.5
	7	-26.7
	8	31.1
	9	31.1
	10	-26.7
	11	-0.1
	12	-22.4
	13	-33.0
	14	-0.1
	15	-0.1

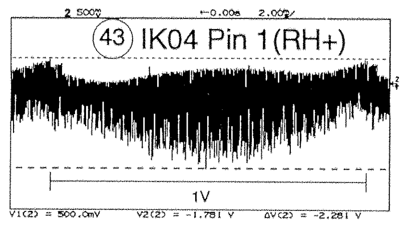
Circuit No.	Pin No.	Voltage VDC
IK07	1	5.0
	2	5.2
	3	5.1
	4	0
	5	0
	6	4.0
	7	0
	8	0
	9	0
	10	0
	11	0
	12	5.3
	13	5.3
	14	5.3
	15	5.3
	16	11.8

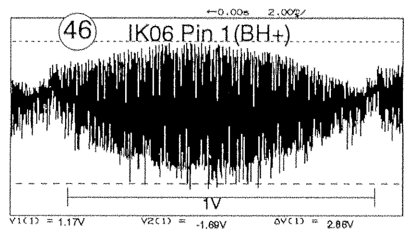
Circuit No.	Pin No.	Voltage VDC
QK01	B	0.6
	C	0.3
	E	0

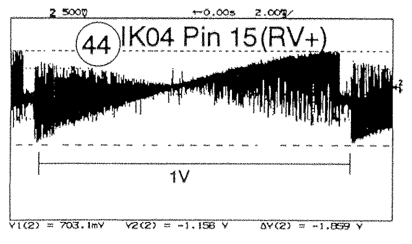

(42) RR Connector Pin 4

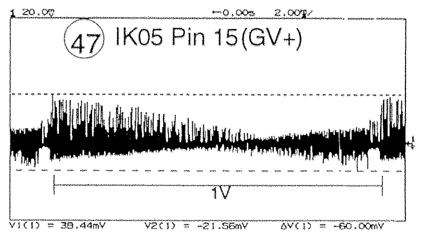

(45) IK06 Pin14(BV-)


(48) IK05 Pin 1(GH+)


(43) IK04 Pin 1(RH+)

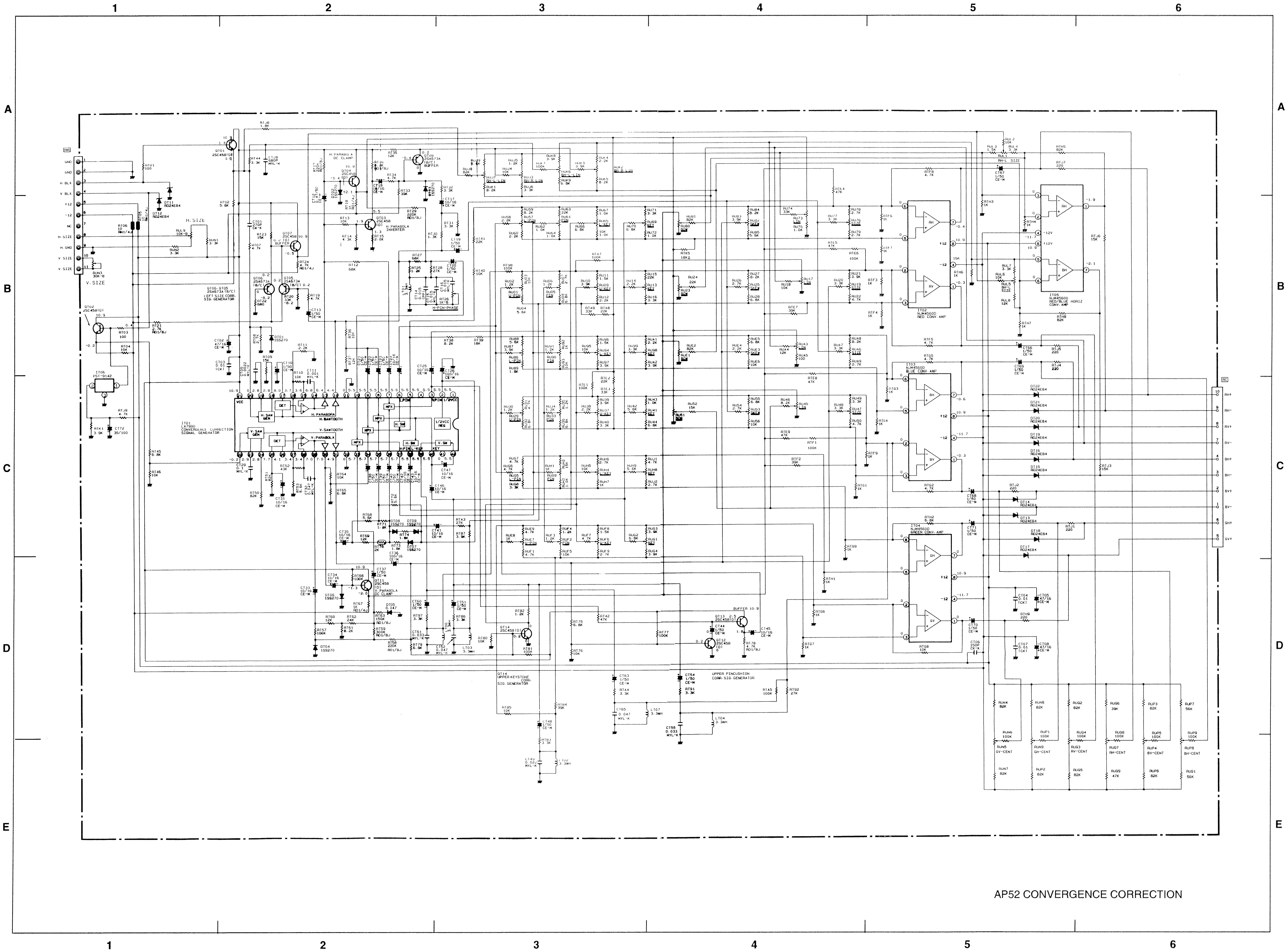

(46) IK06 Pin 1(BH+)


(44) IK04 Pin 15(RV+)


(47) IK05 Pin 15(GV+)

BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
IT01
LA7992
CONVERGENCE CORRECTION
SIGNAL GENERATOR
IT02
NJM4560D
RED CONV. AMP
IT03
NJM4560D
BLUE CONV. AMP
IT04
NJM4560D
GREEN CONV. AMP
IT05
NJM4560D
RED/BLUE HORIZ
CONV. AMP
IT06
PST-9142
H-SIZE
V-SIZE
H.PARABOLA
DC CLAMP
H.PARABOLA
INVERTER
BUFFER
QT06-QT05
LEFT SIZE CORR.
SIG. GENERATOR
V.PARABOLA
DC CLAMP
QT14
UPPER KEYSTONE
CORR.
SIG. GENERATOR
UPPER PINCUSHION
CORR. SIG. GENERATOR
RV-CENT
GV-CENT
BV-CENT
RH-CENT
GH-CENT
BH-CENT
RH+
RH-
RV+
RV-
BH+
BH-
BV+
BV-
GH+
GV+

AP52 CONVERGENCE CORRECTION

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IT01	1	5.5
	2	5.5
	3	5.5
	4	5.5
	5	5.5
	6	5.5
	7	5.5
	8	5.5
	9	5.5
	10	5.5
	11	0
	12	4.4
	13	6.4
	14	6.8
	15	3.6
	16	3.7
	17	8.0
	18	2.8
	19	2.8
	20	0
	21	10.9

Circuit No.	Pin No.	Voltage VDC
IT01	22	-0.2
	23	2.9
	24	2.8
	25	7.7
	26	4.1
	27	3.4
	28	3.4
	29	7.0
	30	7.0
	31	4.9
	32	0
	33	5.7
	34	5.7
	35	5.7
	36	5.7
	37	5.7
	38	5.5
	39	5.5
	40	5.5
	41	0
	42	5.5

Circuit No.	Pin No.	Voltage VDC
IT02	1	-0.3
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	-0.4
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT03	1	-0.3
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	-0.6
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT04	1	0
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	0
	8	10.9

Circuit No.	Pin No.	Voltage VDC
IT05	1	-1.9
	2	0
	3	0
	4	-11.7
	5	0
	6	0
	7	-2.1
	8	10.9

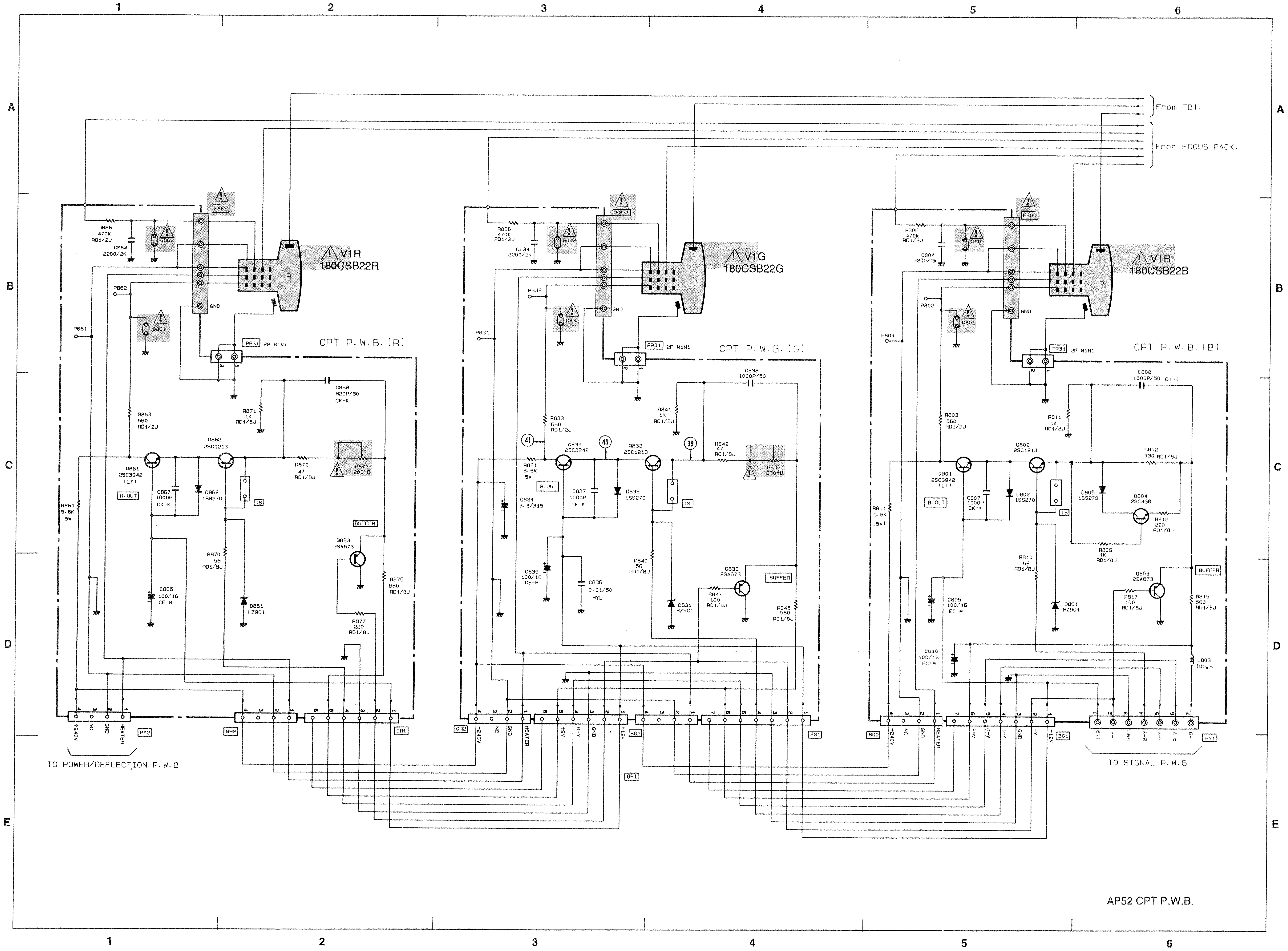
Circuit No.	Pin No.	Voltage VDC
IT06	1	0.4
	2	4.8
	3	0

Circuit No.	Pin No.	Voltage VDC
QT01	B	1.4
	C	10.9
	E	1.0
QT02	B	0.4
	C	10.9
	E	-0.2
QT03	B	1.9
	C	5.5
	E	1.3
QT04	B	-1.4
	C	10.9
	E	-2.1
QT05	B	0.2
	C	-8.2
	E	0.2
QT06	B	0
	C	-8.2
	E	0.2

Circuit No.	Pin No.	Voltage VDC
QT07	B	0.2
	C	10.9
	E	-0.5
QT08	B	-0.4
	C	0
	E	0.2
QT11	B	-1.3
	C	10.9
	E	-2.0
QT12	B	0.2
	C	0
	E	0
QT13	B	2.5
	C	10.9
	E	1.8
QT14	B	0.2
	C	0
	E	0

BASIC CIRCUIT DIAGRAM

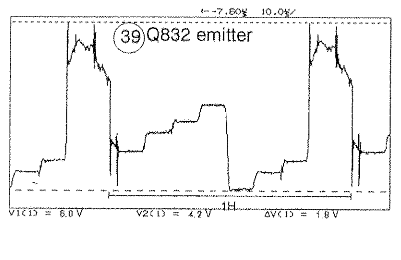
PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
From FBT.
From FOCUS PACK.
V1R
180CSB22R
V1G
180CSB22G
V1B
180CSB22B
E861
E831
E801
G861
G862
G831
G832
G801
G802
CPT P.W.B.(R)
CPT P.W.B.(G)
CPT P.W.B.(B)
PP31 2P MINI
GND
Q861 2SC3942 (LT)
Q862 2SC1213
Q863 2SA673
Q831 2SC3942
Q832 2SC1213
Q833 2SA673
Q801 2SC3942 (LT)
Q802 2SC1213
Q803 2SA673
Q804 2SC458
R-OUT
G-OUT
B-OUT
BUFFER
TS
R866 470K RD1/2J
C864 2200/2K
R863 560 RD1/2J
R861 5.6K 5W
C867 1000P CK-K
D862 1SS270
R871 1K RD1/8J
C868 820P/50 CK-K
R872 47 RD1/8J
R873 200-B
R870 56 RD1/8J
C865 100/16 CE-M
D861 HZ9C1
R875 560 RD1/8J
R877 220 RD1/8J
R836 470K RD1/2J
C834 2200/2K
R833 560 RD1/2J
R831 5.6K 5W
C831 3.3/315
C837 1000P CK-K
D832 1SS270
C835 100/16 CE-M
C836 0.01/50 MYL
R841 1K RD1/8J
C838 1000P/50
R842 47 RD1/8J
R843 200-B
R840 56 RD1/8J
D831 HZ9C1
R847 100 RD1/8J
R845 560 RD1/8J
R806 470k RD1/2J
C804 2200/2k
R803 560 RD1/2J
R801 5.6K (5W)
C807 1000P CK-K
D802 1SS270
R811 1K RD1/8J
C808 1000P/50 CK-K
R812 130 RD1/8J
D805 1SS270
R818 220 RD1/8J
R809 1K RD1/8J
R810 56 RD1/8J
C805 100/16 EC-M
D801 HZ9C1
R817 100 RD1/8J
R815 560 RD1/8J
C810 100/16 EC-M
L803 100μH
(39)
(40)
(41)
P861
P862
P831
P832
P801
P802
PY2
GR2
GR1
BG2
BG1
PY1
+240V
NC
GND
HEATER
+9V
R-Y
G-Y
B-Y
-Y
+12V
+12
Y-
Y+
TO POWER/DEFLECTION P.W.B
TO SIGNAL P.W.B
AP52 CPT P.W.B.

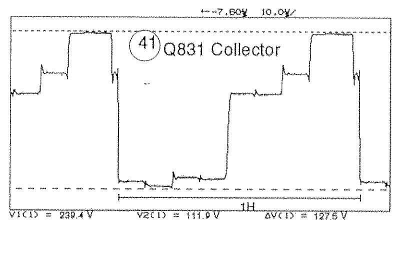
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
Q801	B	11.8
	C	172.8
	E	11.2
Q802	B	5.3
	C	11.2
	E	4.9
Q803	B	4.1
	C	0
	E	4.2
Q804	B	4.8
	C	4.5
	E	4.6
Q831	B	11.8
	C	175.8
	E	11.3

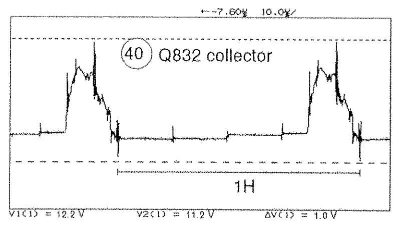
Circuit No.	Pin No.	Voltage VDC
Q832	B	5.2
	C	11.2
	E	4.8
Q833	B	4.1
	C	0
	E	4.2
Q861	B	11.8
	C	191.2
	E	11.2
Q862	B	5.1
	C	11.2
	E	4.7
Q863	B	4.1
	C	0
	E	4.2



(39) Q832 emitter



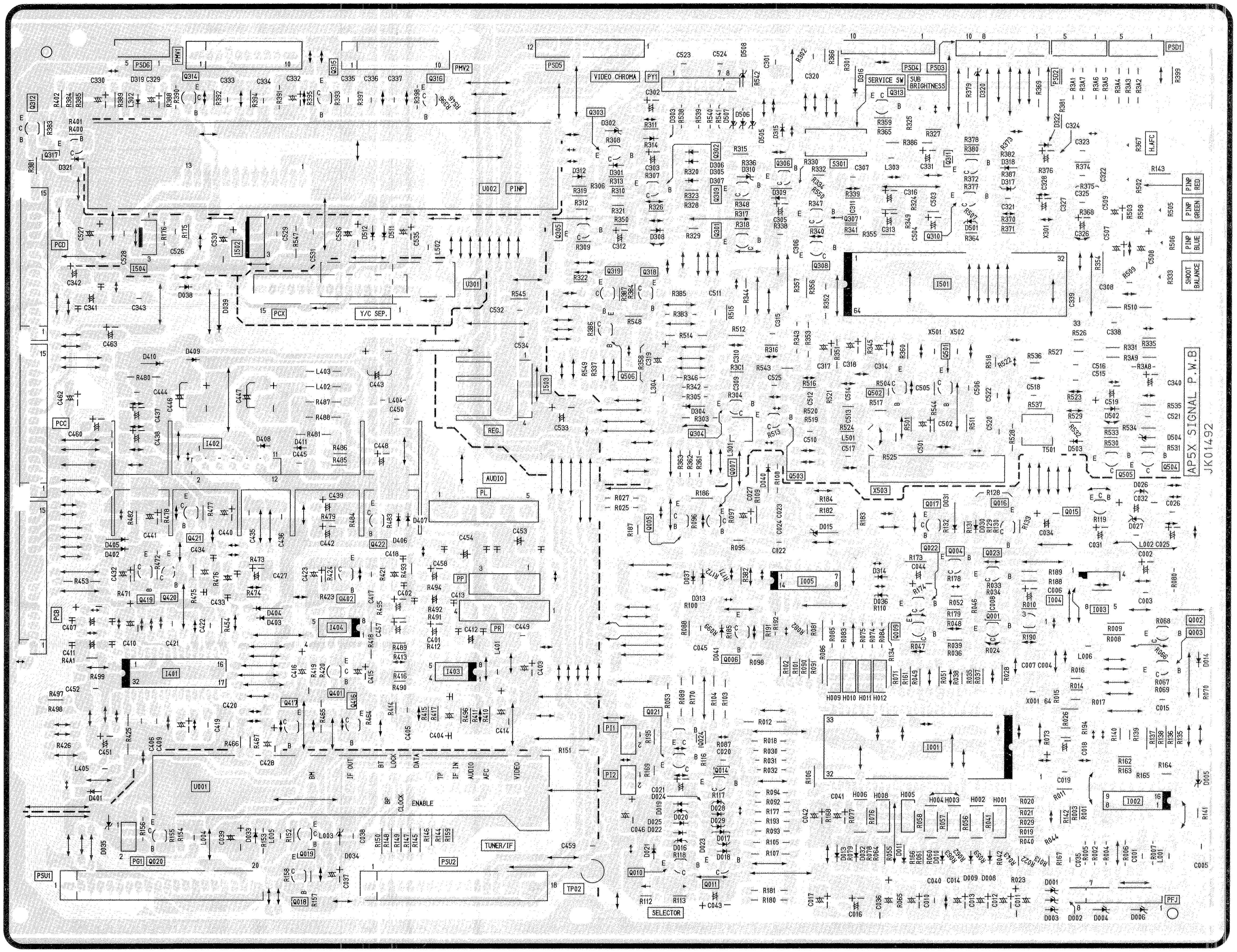
(41) Q831 Collector



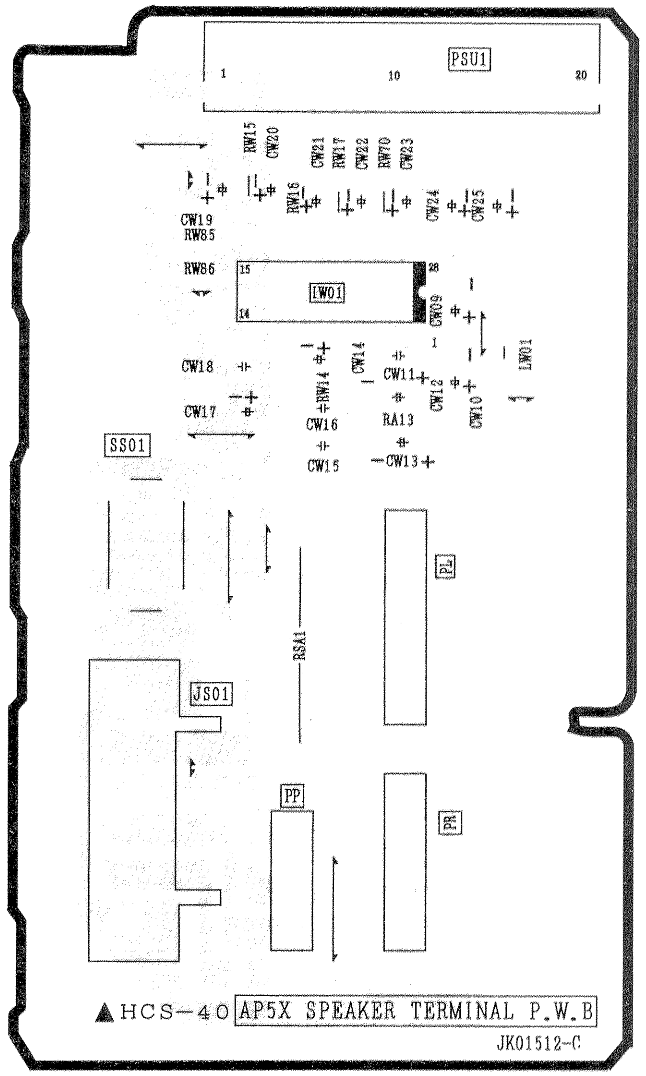
(40) Q832 collector

PRINTED CIRCUIT BOARD

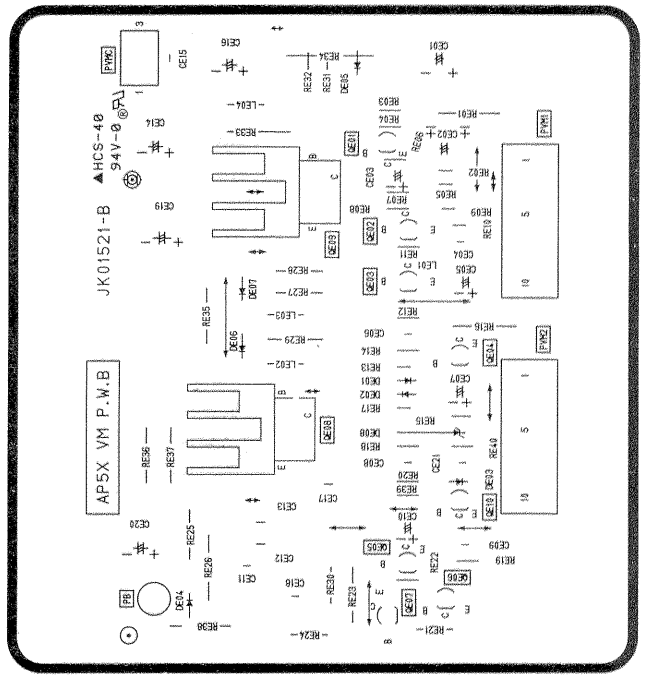
SIGNAL P.C.B.


AP5X SIGNAL P.W.B
JK01492
VIDEO CHROMA
SERVICE SW
SUB BRIGHTNESS
PINP RED
PINP GREEN
PINP BLUE
SHOOT BALANCE
Y/C SEP.
REG.
AUDIO
TUNER/IF
SELECTOR

SPEAKER TERMINAL P.C.B.

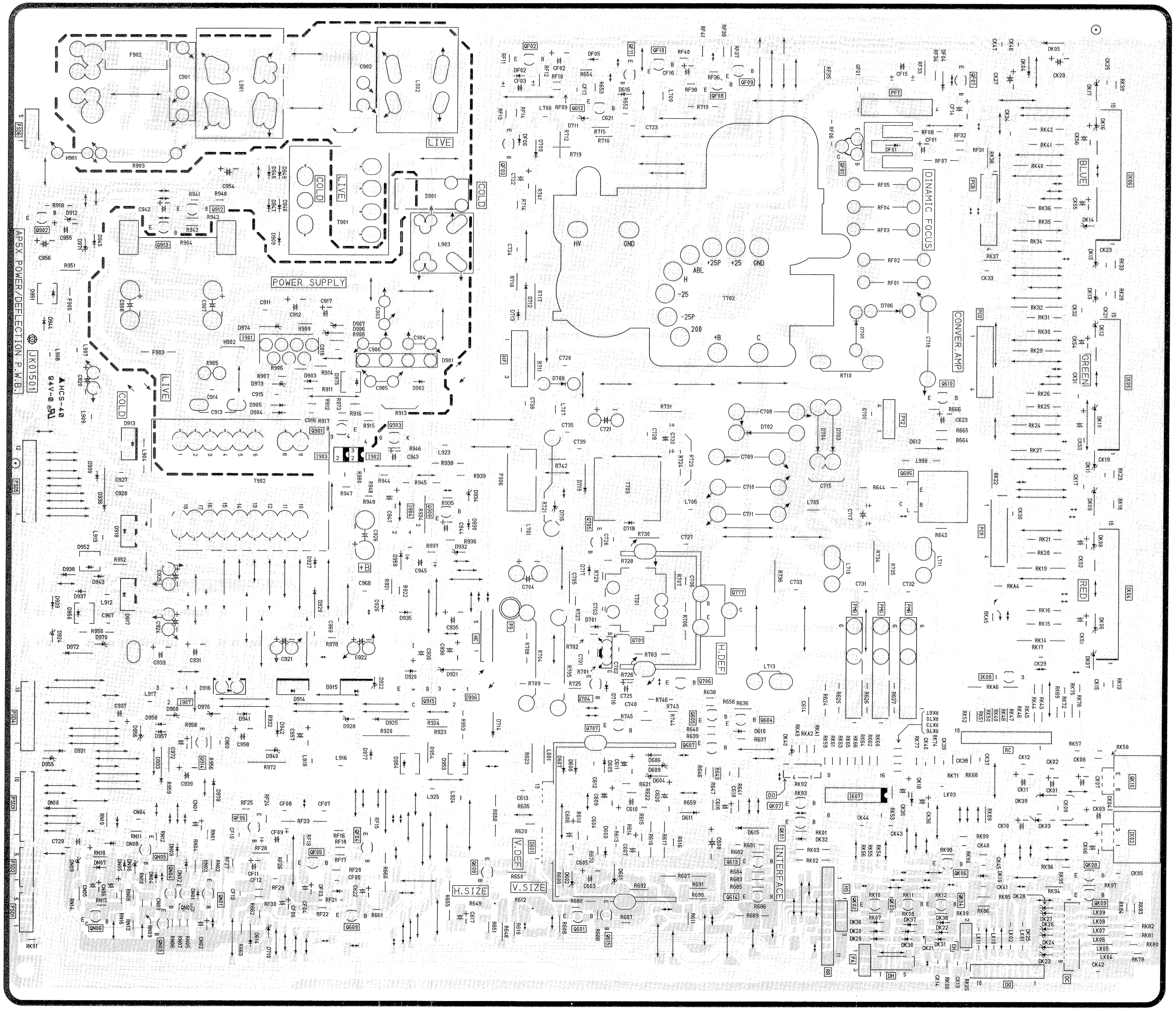

▲HCS-40
AP5X SPEAKER TERMINAL P.W.B
JK01512-C

VM P.C.B.

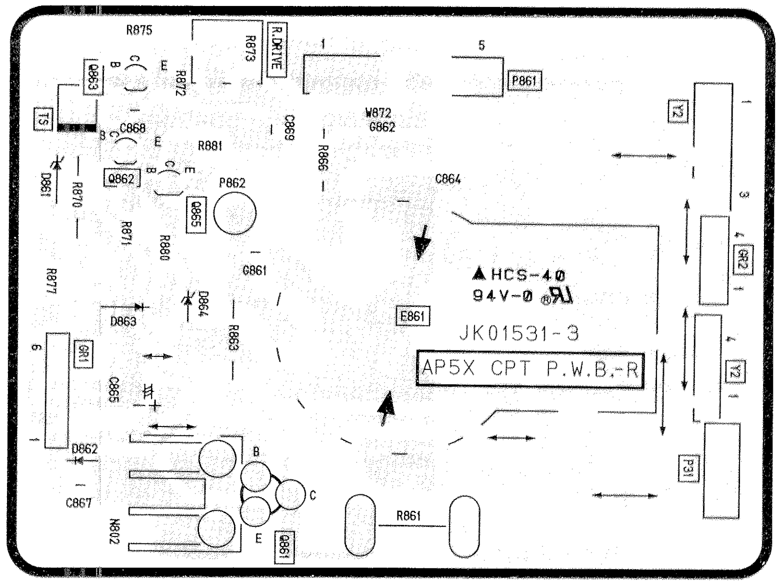

▲HCS-40
94V-0
JK01521-B
AP5X VM P.W.B

PRINTED CIRCUIT BOARD

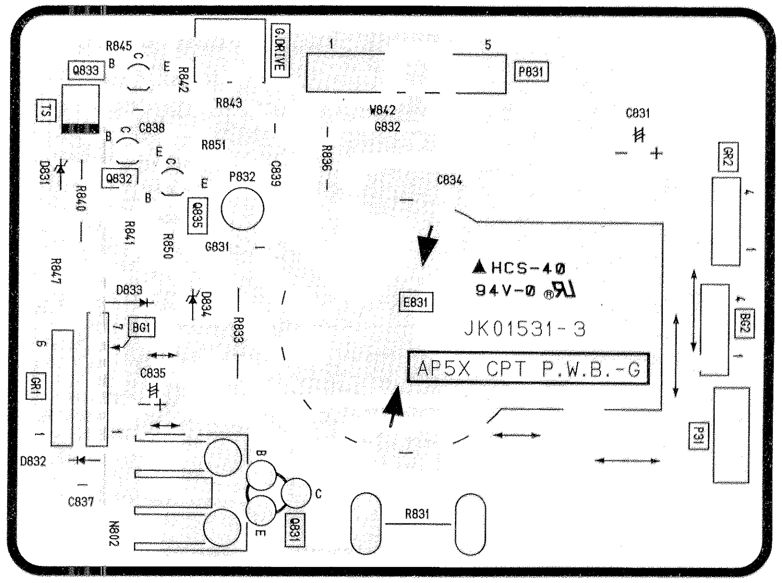
POWER/DEFLECTION P.C.B.


AP5X POWER/DEFLECTION P.W.B.
JK01501
▲HCS-40
94V-0
POWER SUPPLY
LIVE
COLD
HV
GND
ABL
+25P
+25
-25
-25P
T702
DINAMIC FOCUS
CONVER.AMP
BLUE
GREEN
RED
H.DEF
INTERFACE
H.SIZE
V.SIZE
V.DEF

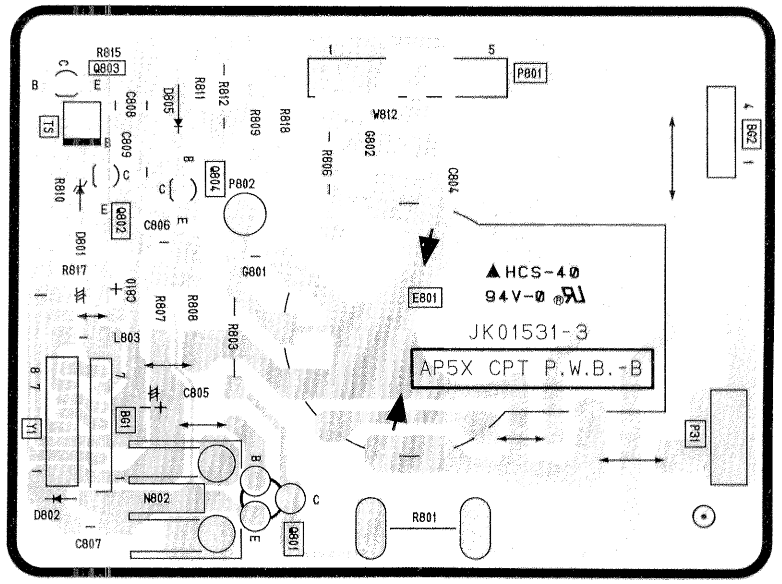
RED CPT P.C.B.


R.DRIVE
▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-R
P861
Q861
Q862
Q863
P862
E861
R861
N802

GREEN CPT P.C.B.

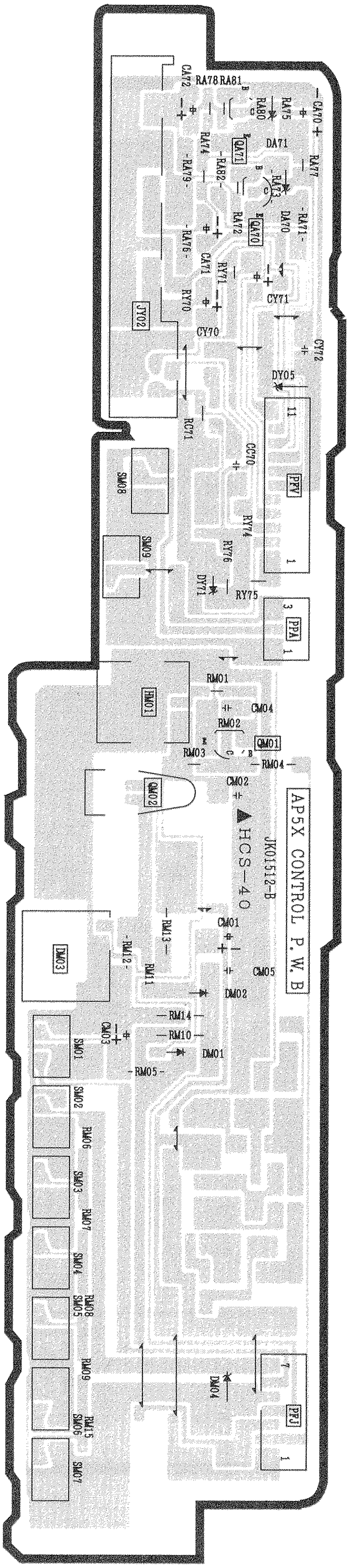

G.DRIVE
▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-G
P831
Q831
Q832
Q833
P832
E831
R831
N802

BLUE CPT P.C.B.


▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-B
P801
Q801
Q802
Q803
Q804
P802
E801
R801
N802

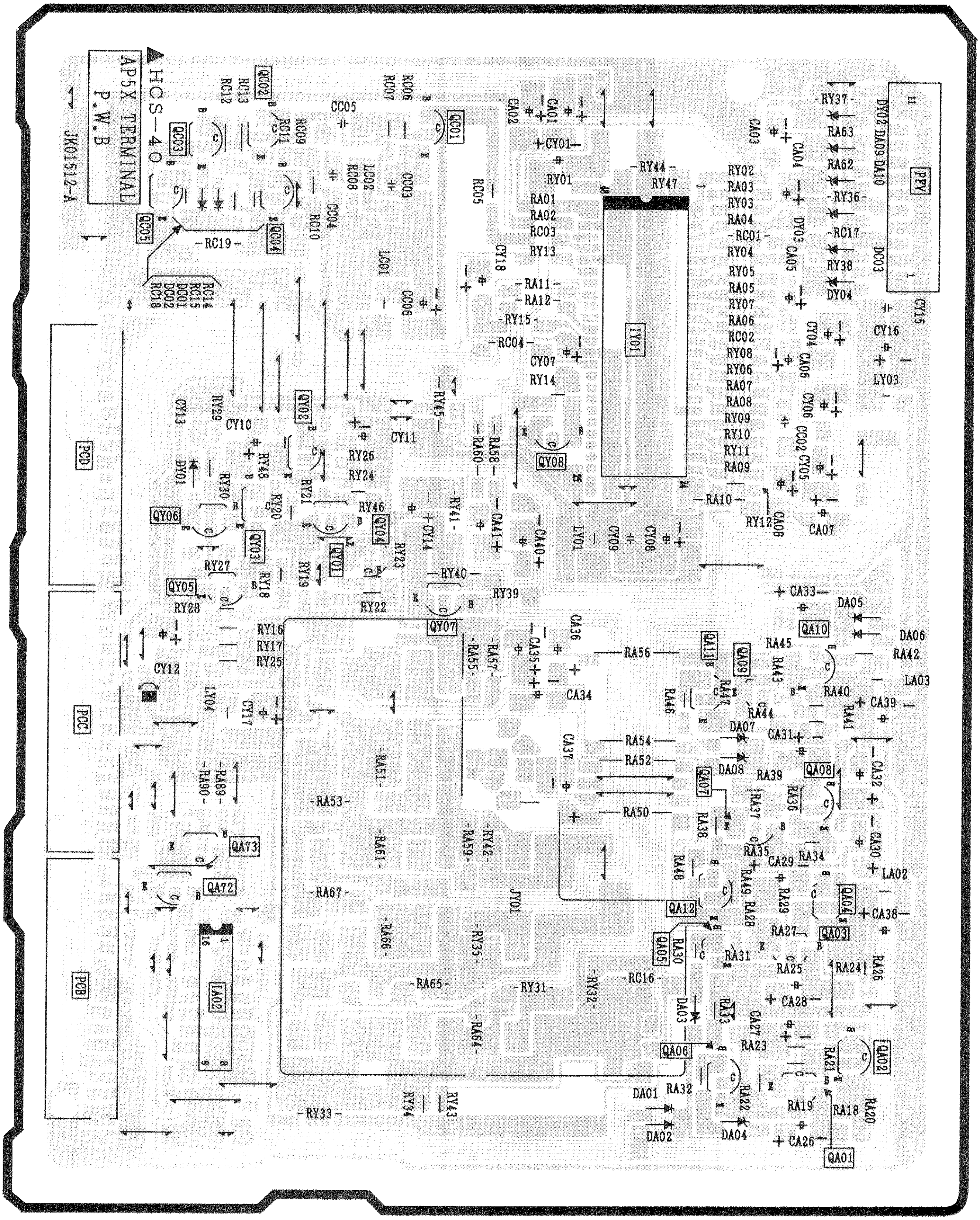
PRINTED CIRCUIT BOARD

CONTROL P.C.B.


AP5X CONTROL P. W. B
JK01512-B
HCS-40
CA72
RA78
RA81
RA75
RA80
CA70
RA74
QA71
DA71
RA77
RA79
RA82
RA73
RA71
RA76
RA72
QA70
DA70
CA71
RY71
CY71
RY70
JY02
CY70
CY72
DY05
RC71
CC70
PFV
SM08
SM09
RY74
RY76
DY71
RY75
PPA
HM01
RM01
CM04
RM02
QM01
RM03
RM04
QM02
CM02
RM13
CM01
DM03
RM12
RM11
CM05
DM02
RM14
CM03
RM10
DM01
SM01
RM05
SM02
RM06
SM03
RM07
SM04
RM08
SM05
RM09
DM04
PFJ
RM15
SM06
SM07

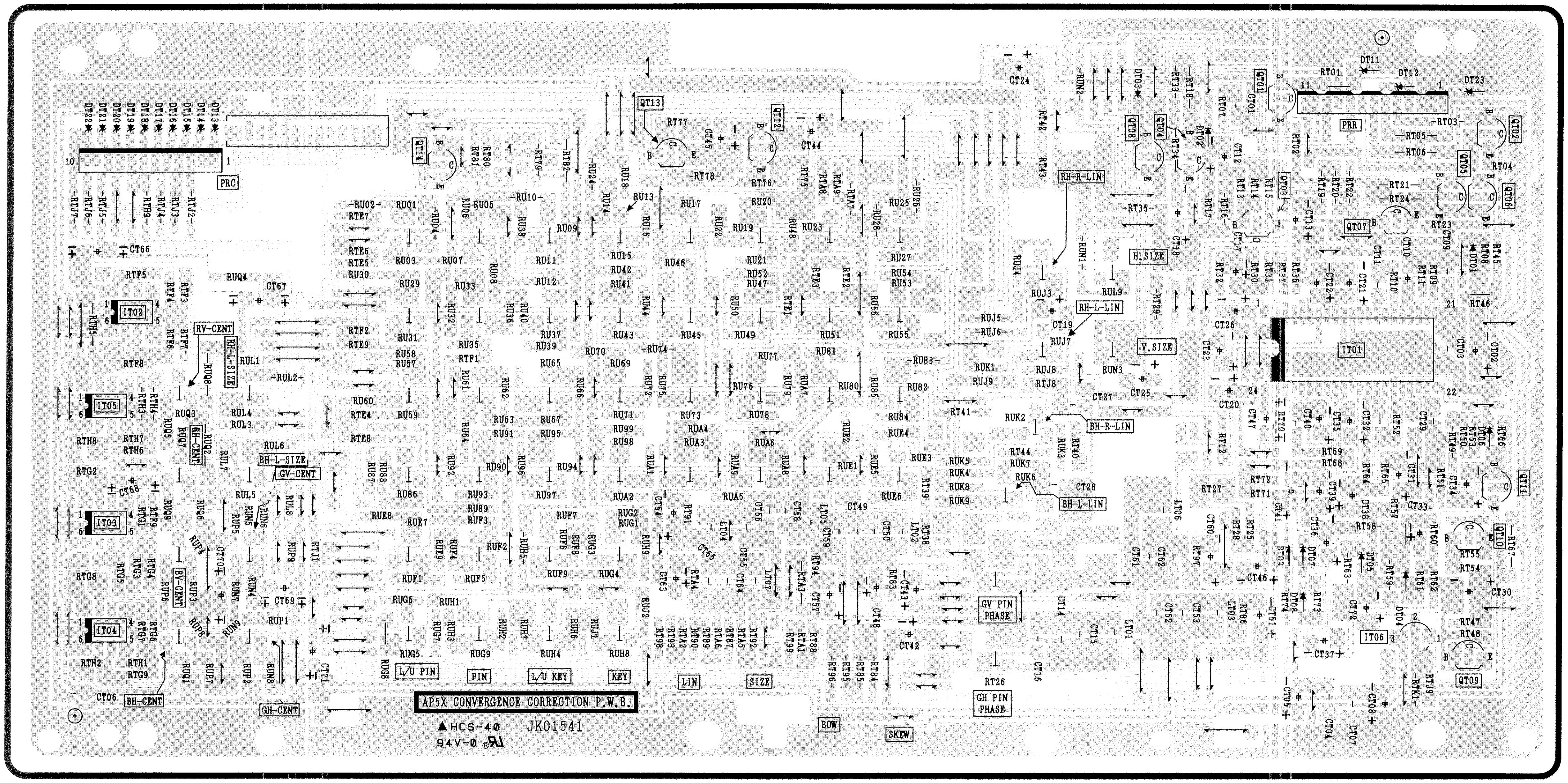
PRINTED CIRCUIT BOARD

TERMINAL P.C.B.

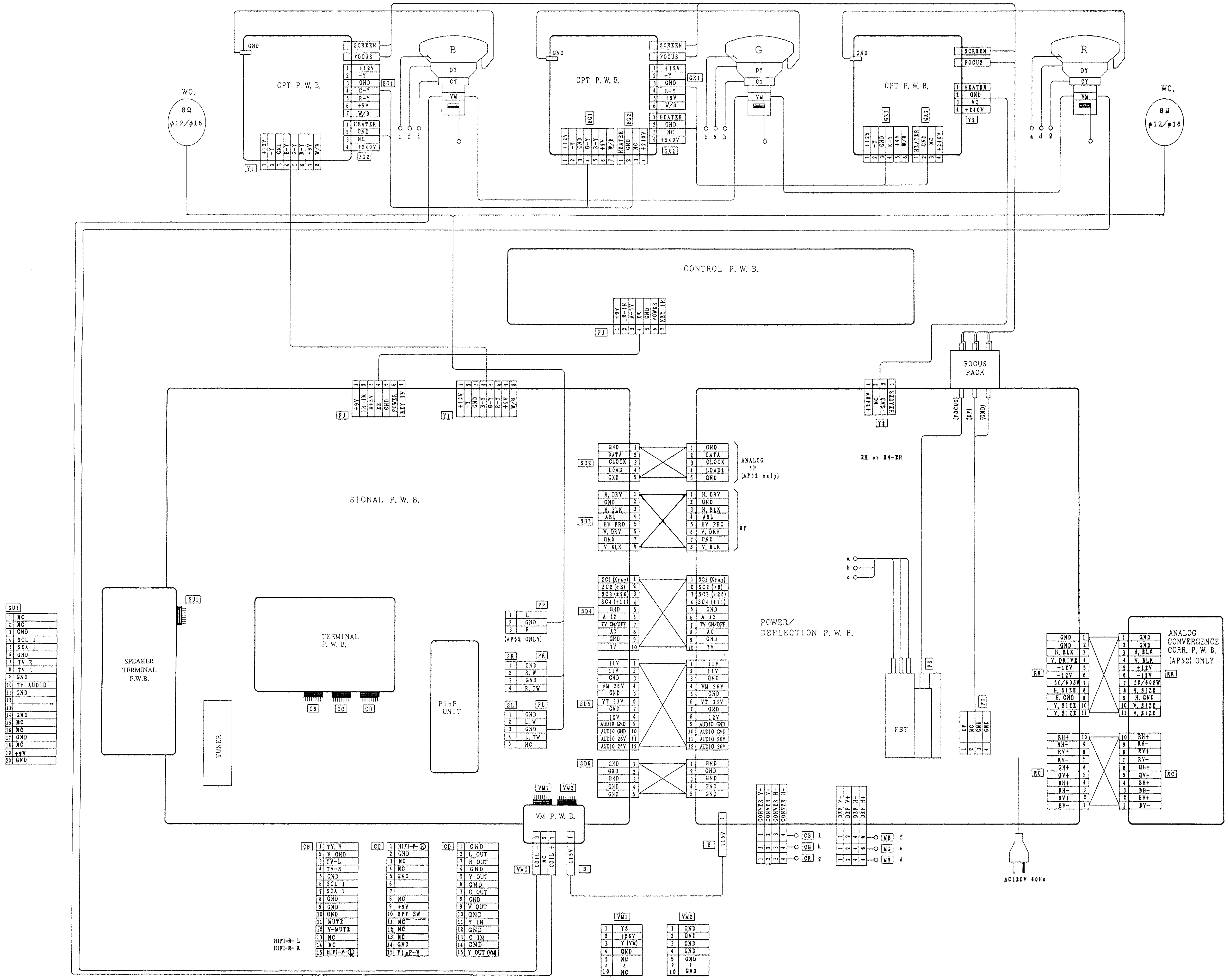

AP5X TERMINAL
P.W.B
HCS-40
JK01512-A
PFV
PCD
PCC
PCB
IY01
IA02
JY01
QC01
QC02
QC03
QC04
QC05
QY01
QY02
QY03
QY04
QY05
QY06
QY07
QY08
QA01
QA02
QA03
QA04
QA05
QA06
QA07
QA08
QA09
QA10
QA11
QA12
QA72
QA73

PRINTED CIRCUIT BOARD

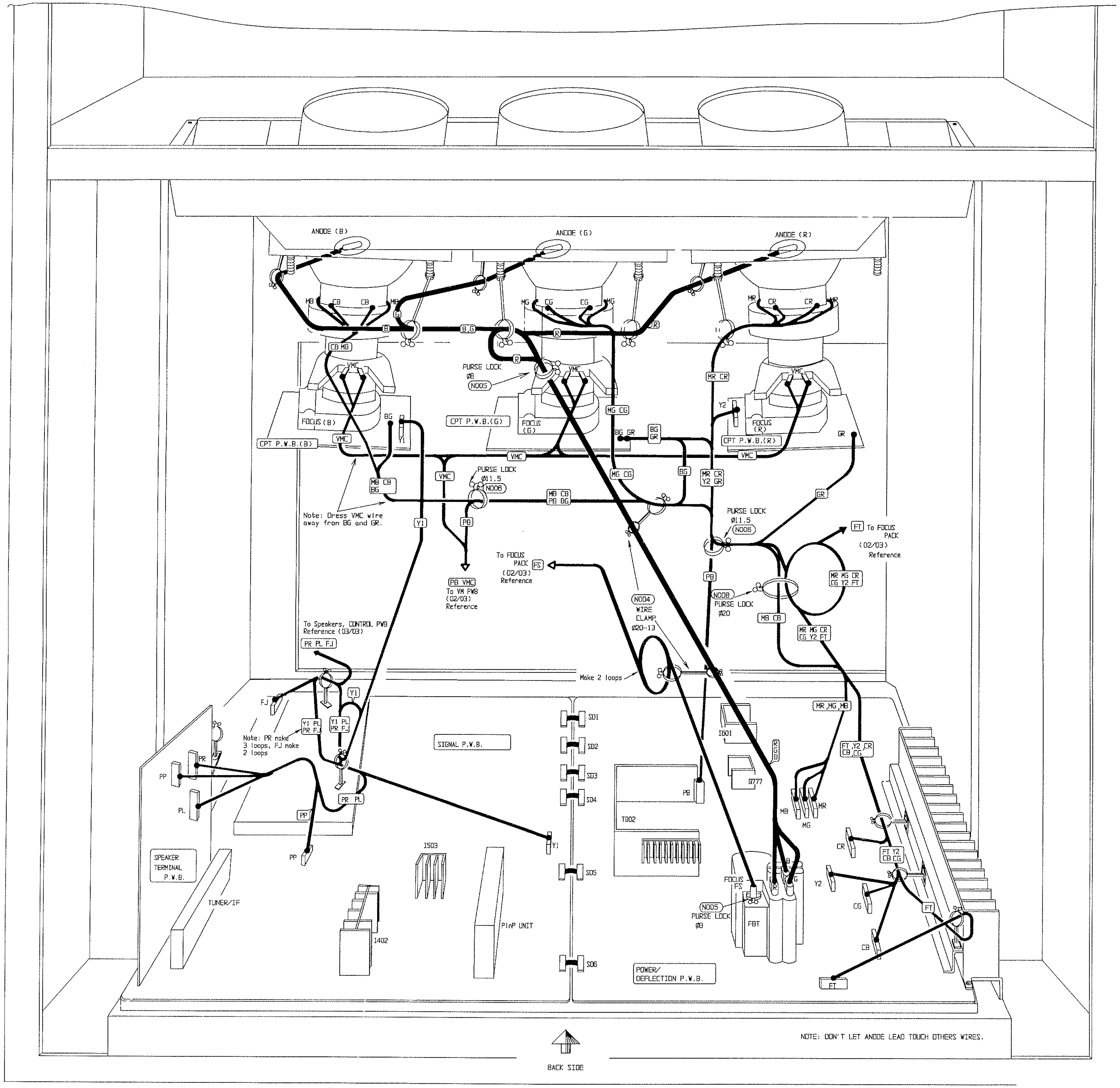
CONVERGENCE CORRECTION P.C.B.


AP5X CONVERGENCE CORRECTION P.W.B.
HCS-40 JK01541
94V-0
IT01
IT02
IT03
IT04
IT05
IT06
PRC
PRR
RV-CENT
RH-L-SIZE
RH-CENT
BH-L-SIZE
GV-CENT
BV-CENT
BH-CENT
GH-CENT
L/U PIN
PIN
L/U KEY
KEY
LIN
SIZE
BOW
SKEW
GV PIN PHASE
GH PIN PHASE
RH-R-LIN
RH-L-LIN
BH-R-LIN
BH-L-LIN
H.SIZE
V.SIZE

WIRING DIAGRAM


CPT P. W. B.
GND
SCREEN
FOCUS
1 +12V
2 -Y
3 GND
4 G-Y
5 R-Y
6 +9V
7 W/B
BG1
1 HEATER
2 GND
3 NC
4 +240V
BG2
Y1
+12V -Y GND B-Y G-Y R-Y +9V W/B
1 2 3 4 5 6 7 8
B
DY
CY
VM
c f i
WO.
8Ω
ϕ12/ϕ16
CPT P. W. B.
1 +12V
2 -Y
3 GND
4 R-Y
5 +9V
6 W/B
GR1
1 HEATER
2 GND
3 NC
4 +240V
GR2
BG1
BG2
+12V -Y GND G-Y R-Y +9V W/B
HEATER GND NC +240V
G
b e h
CPT P. W. B.
SCREEN
FOCUS
1 HEATER
2 GND
3 NC
4 +240V
Y2
GR1
GR2
+12V -Y GND R-Y +9V W/B
HEATER GND NC +240V
R
a d g
CONTROL P. W. B.
FJ
1 +9V
2 IR-IN
3 A+5V
4 EE
5 GND
6 POWER
7 KEY IN
FOCUS PACK
Y2
4 +240V
3 NC
2 GND
1 HEATER
(FOCUS)
(DF)
(GND)
FJ
1 +9V
2 IR-IN
3 A+5V
4 EE
5 GND
6 POWER
7 KEY IN
Y1
1 +12V
2 -Y
3 GND
4 B-Y
5 G-Y
6 R-Y
7 +9V
8 W/B
SIGNAL P. W. B.
SD2
1 GND
2 DATA
3 CLOCK
4 LOAD
5 GND
1 GND
2 DATA
3 CLOCK
4 LOAD2
5 GND
ANALOG
5P
(AP52 only)
SD3
1 H. DRV
2 GND
3 H. BLK
4 ABL
5 HV PRO
6 V. DRV
7 GND
8 V. BLK
8P
SD4
1 SC1 (Xray)
2 SC2 (+B)
3 SC3 (±26)
4 SC4 (+11)
5 GND
6 A 12
7 TV ON/OFF
8 AC
9 GND
10 7V
SD5
1 11V
2 11V
3 GND
4 VM 26V
5 GND
6 VT 33V
7 GND
8 12V
9 AUDIO GND
10 AUDIO GND
11 AUDIO 26V
12 AUDIO 26V
SD6
1 GND
2 GND
3 GND
4 GND
5 GND
EH or EH-EH
POWER/
DEFLECTION P. W. B.
a b c
FBT
FS
FT
1 DF
2 NC
3 GND
4 GND
PP
1 L
2 GND
3 R
(AP52 ONLY)
SR
PR
1 GND
2 R. W
3 GND
4 R. TW
SL
PL
1 GND
2 L. W
3 GND
4 L. TW
5 NC
SU1
1 NC
2 NC
3 GND
4 SCL 1
5 SDA 1
6 GND
7 TV R
8 TV L
9 GND
10 TV AUDIO
11 GND
12
13
14 GND
15 NC
16 NC
17 GND
18 NC
19 +9V
20 GND
SPEAKER TERMINAL P.W.B.
TERMINAL P. W. B.
CB
CC
CD
TUNER
PinP UNIT
VM1
VM2
VM P. W. B.
VMC
3 COIL -
2 NC
1 COIL +
1 115V
B
CB
1 TV. V
2 V GND
3 TV-L
4 TV-R
5 GND
6 SCL 1
7 SDA 1
8 GND
9 GND
10 GND
11 MUTE
12 V-MUTE
13 NC
14 NC
15 HIFI-P-Ⓛ
HIFI-R- L
HIFI-R- R
CC
1 HIFI-P-Ⓡ
2 GND
3 NC
4 NC
5 GND
6
7
8 NC
9 +9V
10 BPF SW
11 NC
12 NC
13 NC
14 GND
15 PinP-V
CD
1 GND
2 L OUT
3 R OUT
4 GND
5 Y OUT
6 GND
7 C OUT
8 GND
9 V OUT
10 GND
11 Y IN
12 GND
13 C IN
14 GND
15 Y OUT (VM)
VM1
1 YS
2 +26V
3 Y (VM)
4 GND
5 NC
10 NC
VM2
1 GND
2 GND
3 GND
4 GND
5 GND
10 GND
CONVER V- CONVER V+ CONVER H- CONVER H+
CB i
CG h
CR g
DEF V- DEF V+ DEF H- DEF H+
MB f
MG e
MR d
AC120V 60Hz
RR
1 GND
2 GND
3 H. BLK
4 V. DRIVE
5 +12V
6 -12V
7 50/60SW
8 H. SIZE
9 H. GND
10 V. SIZE
11 V. SIZE
1 GND
2 GND
3 H. BLK
4 V. BLK
5 +12V
6 -12V
7 50/60SW
8 H. SIZE
9 H. GND
10 V. SIZE
11 V. SIZE
RC
10 RH+
9 RH-
8 RV+
7 RV-
6 GH+
5 GV+
4 BH+
3 BH-
2 BV+
1 BV-
ANALOG CONVERGENCE CORR. P. W. B.
(AP52) ONLY

50EX14BV WIRING DRAWING (1/3)

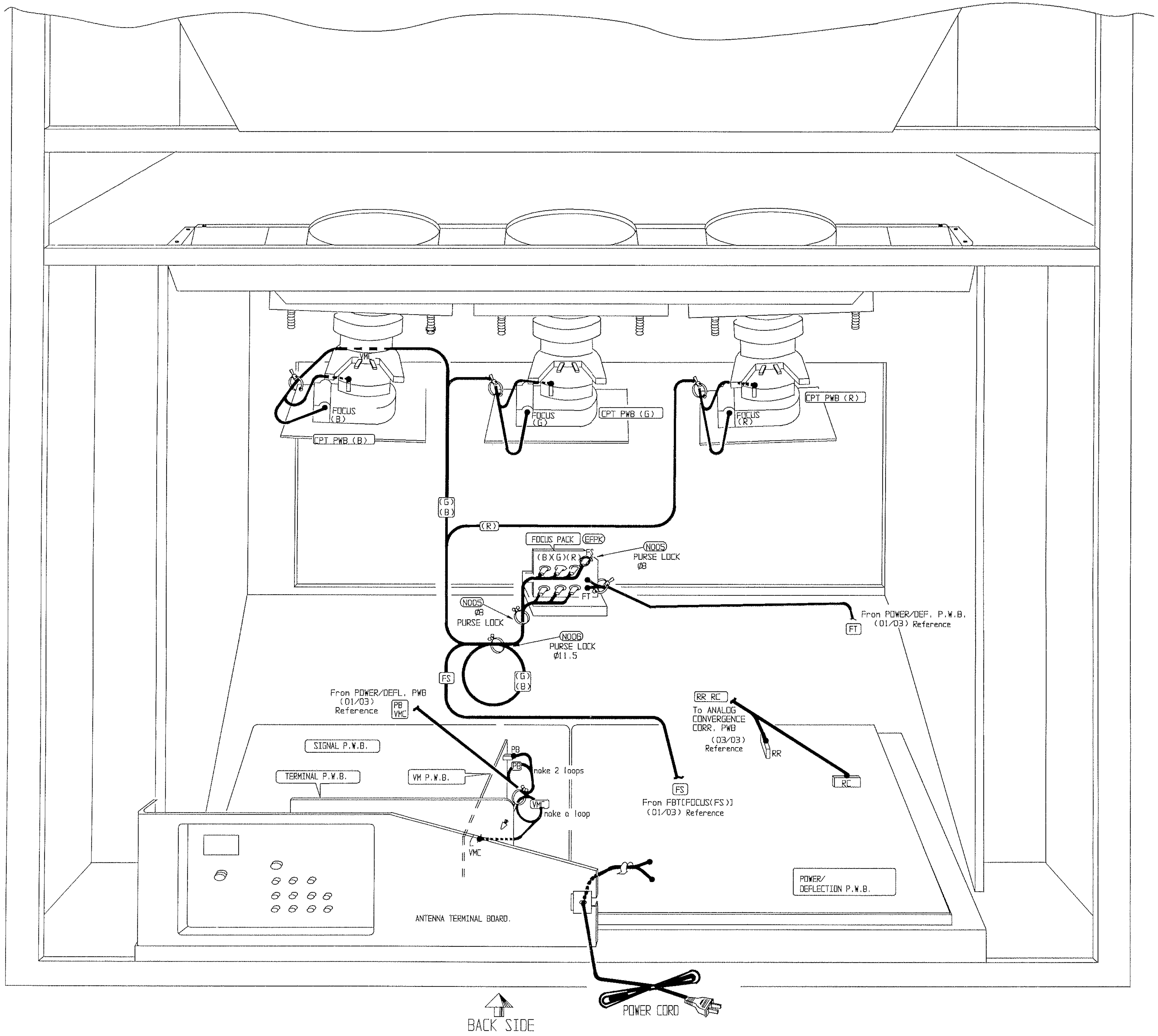

ANODE (B)
ANODE (G)
ANODE (R)
MB
CB
CB
MB
MG
CG
CG
MG
MR
CR
CR
MR
B
G
B,G
R
R
R
CB MB
VMC
VMC
VMC
PURSE LOCK
Ø8
N005
MR CR
Y2
FOCUS (B)
BG
Y1
CPT P.W.B.(G)
FOCUS (G)
MG CG
BG GR
BG GR
FOCUS (R)
CPT P.W.B.(R)
GR
CPT P.W.B.(B)
VMC
VMC
VMC
VMC
PURSE LOCK
Ø11.5
N006
MB CB BG
MB CB PB BG
MG CG
BG
MR CR Y2 GR
GR
PURSE LOCK
Ø11.5
N006
FT
To FOCUS PACK
(02/03)
Reference
Y1
PB
PB VMC
To VM PWB
(02/03)
Reference
To FOCUS PACK
FS
(02/03)
Reference
PB
N004
WIRE CLAMP
Ø20-13
N008
PURSE LOCK
Ø20
MR MG CR CG Y2 FT
MB CB
MR MG CR CG Y2 FT
To Speakers, CONTROL PWB
Reference (03/03)
PR PL FJ
Make 2 loops
Y1
FJ
Y1 PL PR FJ
Y1 PL PR FJ
PR
PP
PL
PR PL
PP
PP
Y1
SIGNAL P.W.B.
SD1
SD2
SD3
SD4
SD5
SD6
I601
R G B
Q777
MR,MG,MB
FT,Y2,CR CB,CG
PB
T902
MB
MG
MR
CR
FT Y2 CB CG
Y2
CG
CB
FT
FT
FOCUS FS
N005
PURSE LOCK
Ø8
FBT
R
B
G
SPEAKER TERMINAL P.W.B.
TUNER/IF
I503
I402
PinP UNIT
POWER/ DEFLECTION P.W.B.
BACK SIDE

Note: Dress VMC wire away from BG and GR.

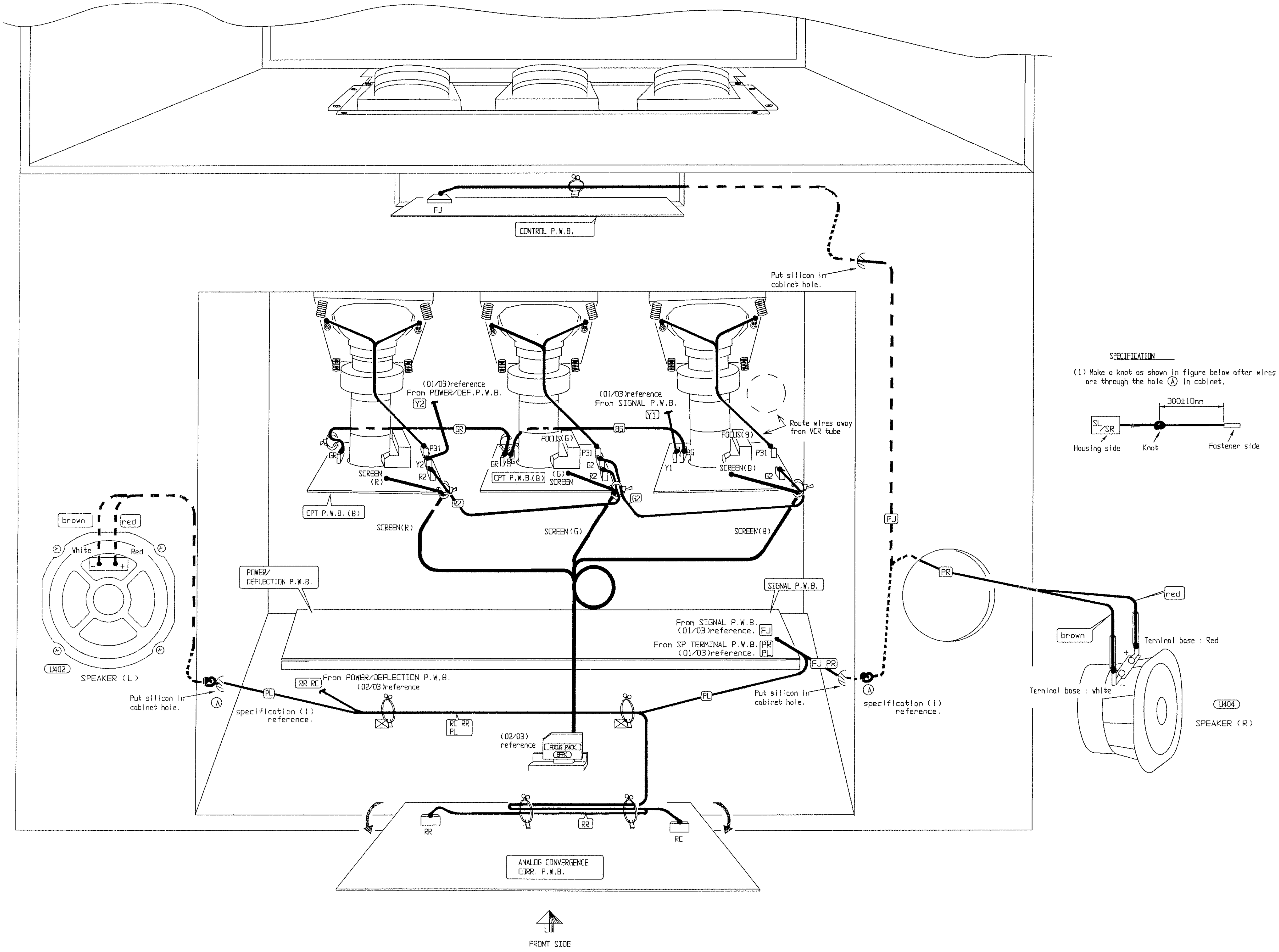
Note: PR make 3 loops, FJ make 2 loops

NOTE: DON'T LET ANODE LEAD TOUCH OTHERS WIRES.

50EX14BV WIRING DRAWING (2/3)


VMC
FOCUS (B)
CPT PWB (B)
FOCUS (G)
CPT PWB (G)
CPT PWB (R)
FOCUS (R)
(G) (B)
(R)
FOCUS PACK
EFPK
(B)(G)(R)
FS
N005
PURSE LOCK
Ø8
FT
N005
Ø8
PURSE LOCK
N006
PURSE LOCK
Ø11.5
From POWER/DEF. P.W.B. (01/03) Reference
FT
FS
(G) (B)
From POWER/DEFL. PWB (01/03) Reference
PB
VMC
RR RC
To ANALOG CONVERGENCE CORR. PWB (03/03) Reference
RR
RC
SIGNAL P.W.B.
TERMINAL P.W.B.
VM P.W.B.
PB
PB
make 2 loops
VMC
make a loop
FS
From FBT[FOCUS(FS)] (01/03) Reference
VMC
POWER/
DEFLECTION P.W.B.
ANTENNA TERMINAL BOARD.
BACK SIDE
POWER CORD

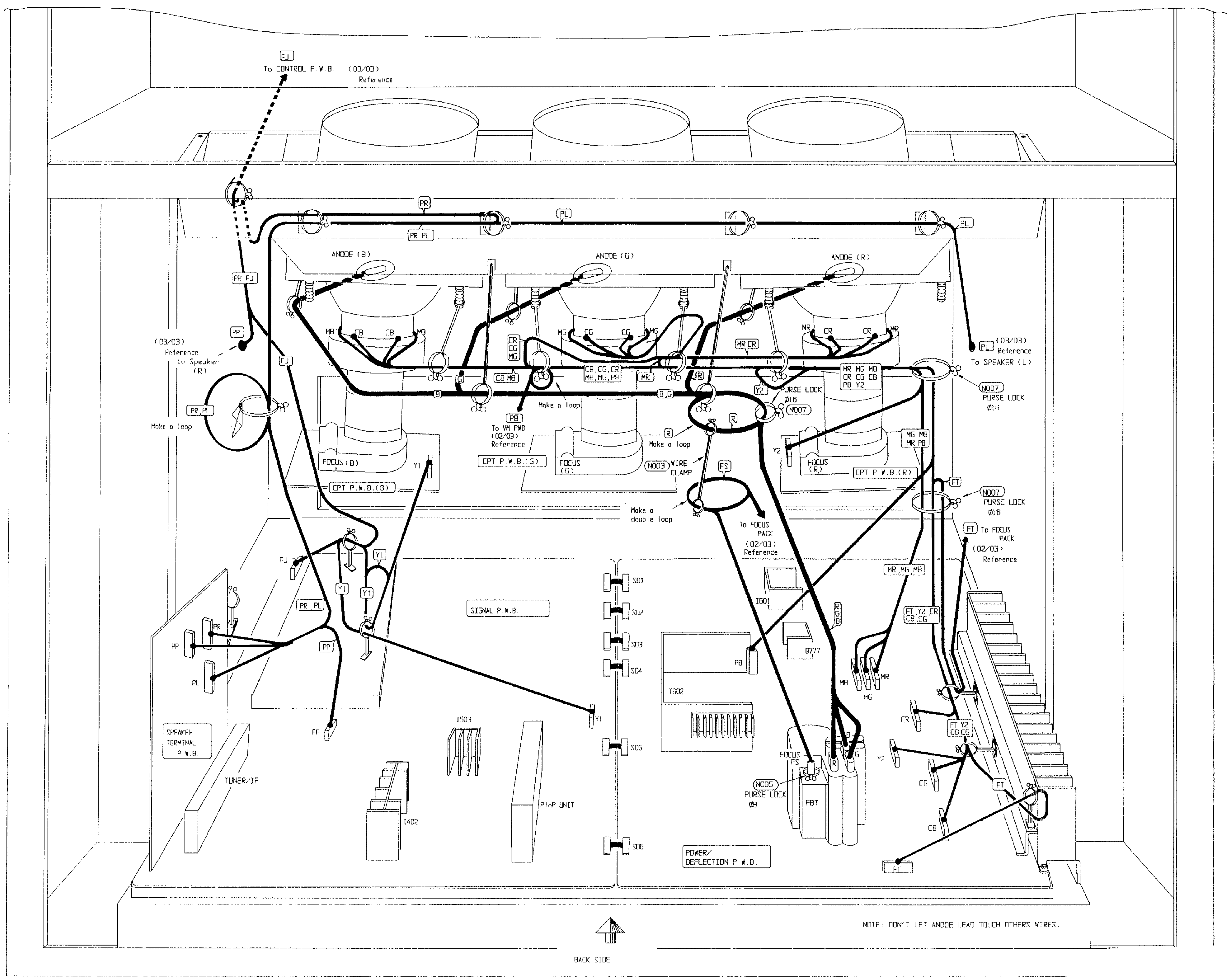
50EX14BV WIRING DRAWING (3/3)


FJ
CONTROL P.W.B.
Put silicon in cabinet hole.
(01/03)reference
From POWER/DEF.P.W.B.
Y2
(01/03)reference
From SIGNAL P.W.B.
Y1
Route wires away from VCR tube
GR
BG
FOCUS(G)
FOCUS(B)
P31
Y2
R2
G2
Y1
SCREEN (R)
(G) SCREEN
SCREEN(B)
CPT P.W.B.(B)
CPT P.W.B. (B)
R2
G2
SCREEN(R)
SCREEN(G)
SCREEN(B)
FJ
brown
red
White
Red
U402
SPEAKER (L)
POWER/ DEFLECTION P.W.B.
SIGNAL P.W.B.
From SIGNAL P.W.B. (01/03)reference. FJ
From SP TERMINAL P.W.B. (01/03)reference. PR PL
FJ PR
RR RC
From POWER/DEFLECTION P.W.B. (02/03)reference
PL
Put silicon in cabinet hole.
A
specification (1) reference.
RC RR PL
(02/03) reference
FOCUS PACK
EFPK
PL
Put silicon in cabinet hole.
A
specification (1) reference.
PR
red
brown
Terminal base : Red
Terminal base : white
U404
SPEAKER (R)
RR
RR
RC
ANALOG CONVERGENCE CORR. P.W.B.
FRONT SIDE
SL/SR
300±10mm
Housing side
Knot
Fastener side

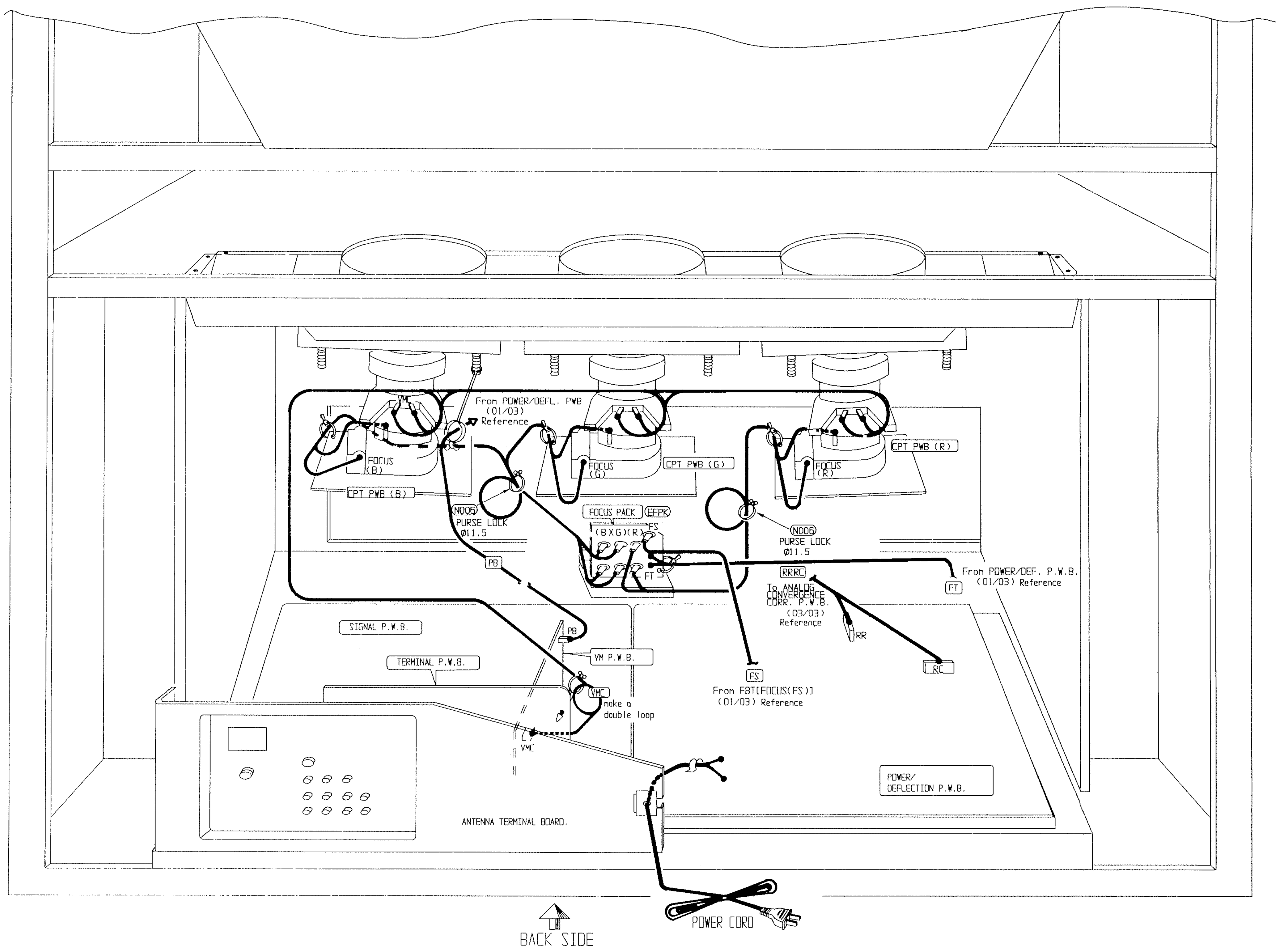
SPECIFICATION

(1) Make a knot as shown in figure below after wires are through the hole Ⓐ in cabinet.

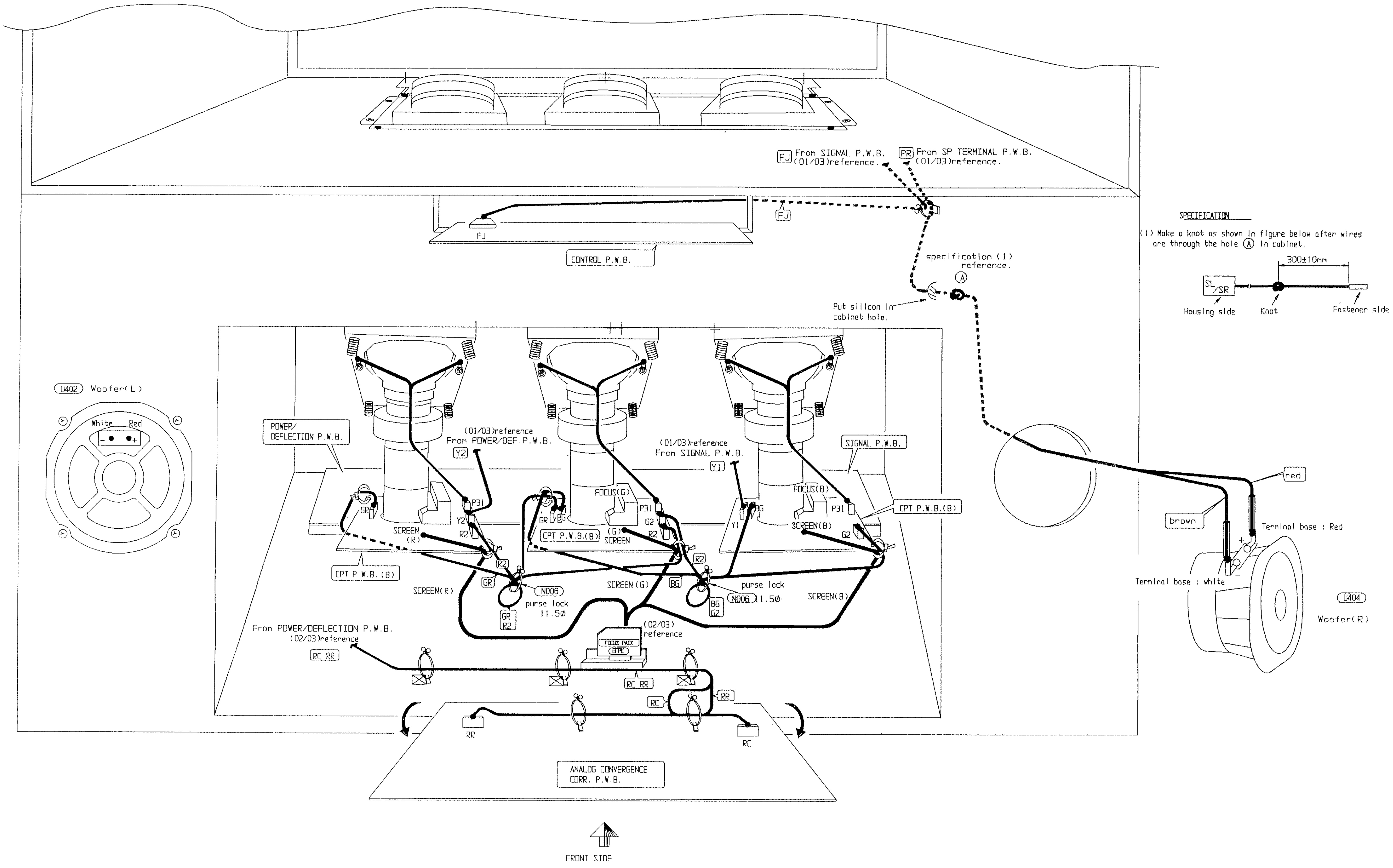
55EX15K WIRING DRAWING (1/3)


EJ
To CONTROL P.W.B. (03/03) Reference
PR
PL
PR PL
PP FJ
ANODE (B)
ANODE (G)
ANODE (R)
MB CB CB MB
MG CG CG MG
MR CR CR MR
(03/03) Reference to Speaker (R)
PP
FJ
PR,PL
Make a loop
CR CG MG
CB MB
B
G
PB
To VM PWB (02/03) Reference
CB,CG,CR MB,MG,PB
Make a loop
MR
R
B,G
MR CR
Y2
PURSE LOCK Ø16
N007
MR MG MB CR CG CB PB Y2
PL
(03/03) Reference To SPEAKER (L)
N007 PURSE LOCK Ø16
R
Make a loop
FOCUS (B)
CPT P.W.B.(B)
Y1
CPT P.W.B.(G)
FOCUS (G)
N003 WIRE CLAMP
FS
FOCUS (R)
CPT P.W.B.(R)
MG MB MR PB
FT
N007 PURSE LOCK Ø16
Make a double loop
To FOCUS PACK (02/03) Reference
FT To FOCUS PACK (02/03) Reference
MR,MG,MB
Y1
FJ
Y1
PR,PL
PR
PP
PL
PP
SIGNAL P.W.B.
SD1
SD2
SD3
SD4
SD5
SD6
I601
R G B
FT,Y2 CR CB,CG
PB
I777
T902
MB
MG
MR
Y1
I503
PP
SPEAKER TERMINAL P.W.B.
TUNER/IF
I402
PinP UNIT
CR
FT Y2 CB CG
FOCUS FS
N005 PURSE LOCK Ø8
FBT
B R G
Y2
CG
CB
FT
FT
POWER/ DEFLECTION P.W.B.
NOTE: DON'T LET ANODE LEAD TOUCH OTHERS WIRES.
BACK SIDE

55EX15K WIRING DRAWING (2/3)


VM
From POWER/DEFL. PWB
(01/03)
Reference
FOCUS
(B)
CPT PWB (B)
FOCUS
(G)
CPT PWB (G)
FOCUS
(R)
CPT PWB (R)
N006
PURSE LOCK
Ø11.5
FOCUS PACK
EFPK
(B)(G)(R)
FS
FT
N006
PURSE LOCK
Ø11.5
PB
RRRC
To ANALOG
CONVERGENCE
CORR. P.W.B.
(03/03)
Reference
From POWER/DEF. P.W.B.
(01/03) Reference
FT
RR
SIGNAL P.W.B.
PB
VM P.W.B.
TERMINAL P.W.B.
VMC
make a
double loop
VMC
FS
From FBT[FOCUS(FS)]
(01/03) Reference
RC
POWER/
DEFLECTION P.W.B.
ANTENNA TERMINAL BOARD.
BACK SIDE
POWER CORD

55EX15K WIRING DRAWING (3/3)

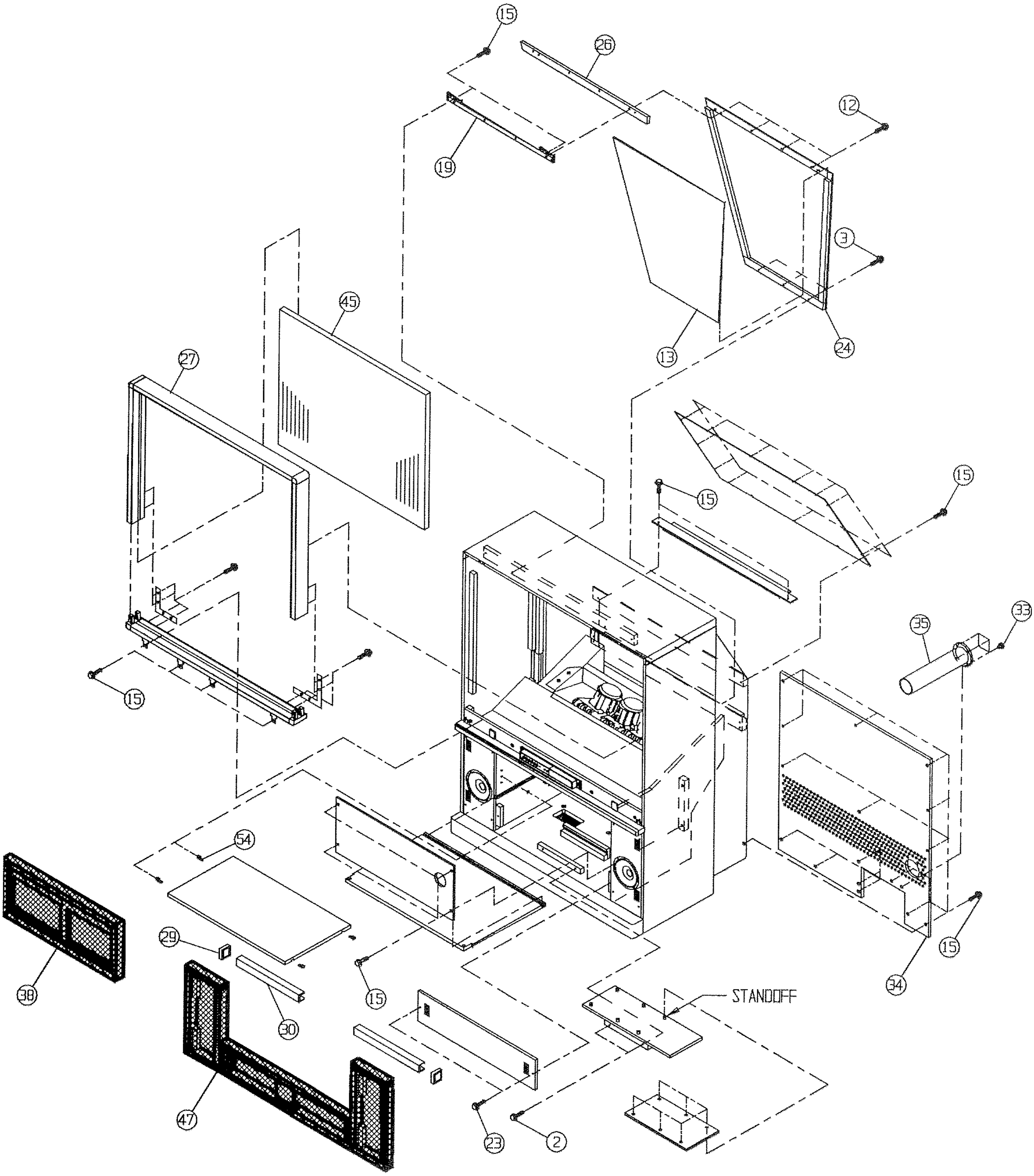


SPECIFICATION

(1) Make a knot as shown in figure below after wires are through the hole Ⓐ in cabinet.

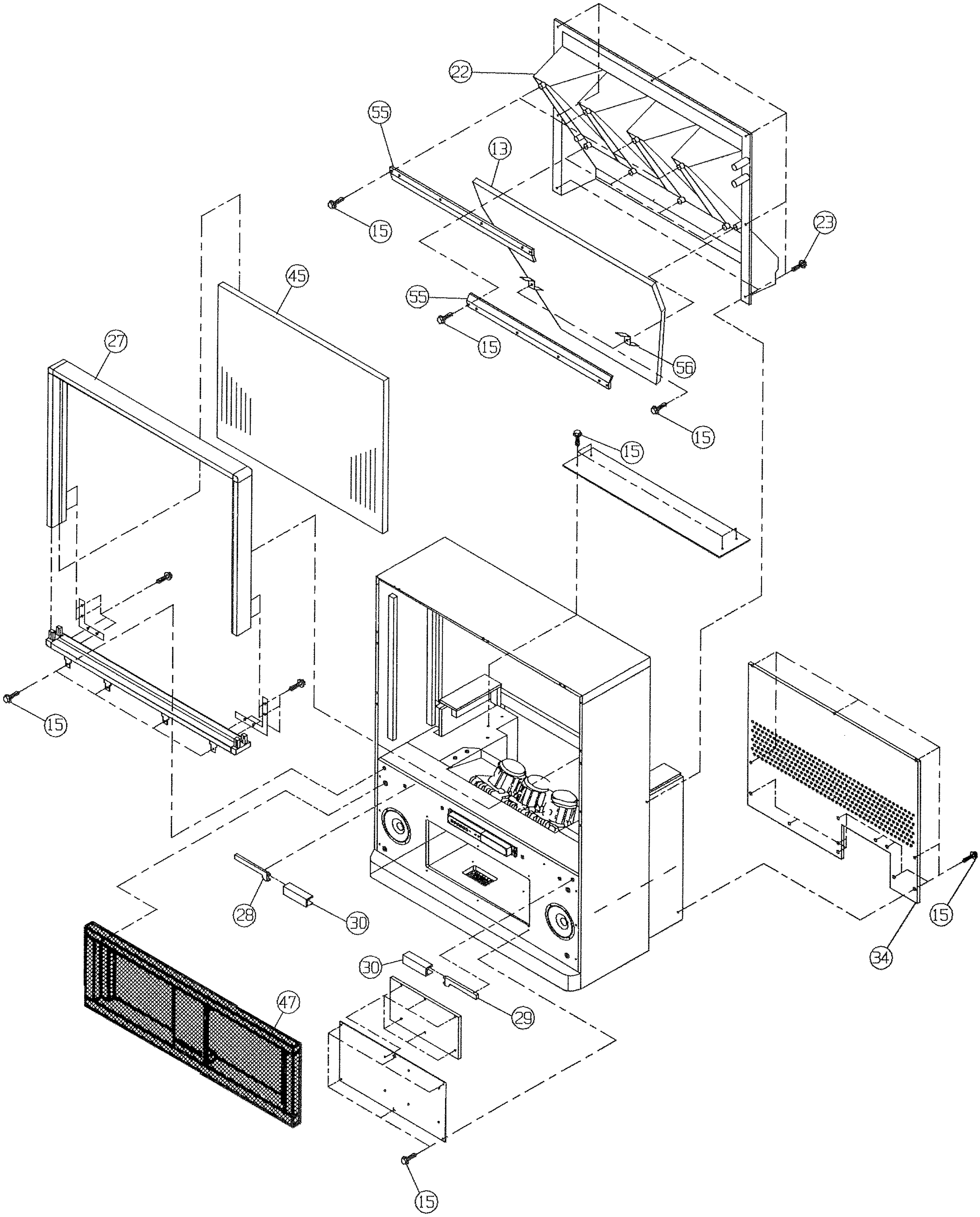
FJ From SIGNAL P.W.B. (01/03)reference.
PR From SP TERMINAL P.W.B. (01/03)reference.
FJ
FJ
CONTROL P.W.B.
specification (1) reference.
Ⓐ
Put silicon in cabinet hole.
300±10mm
SL/SR
Housing side
Knot
Fastener side
U402 Woofer(L)
White
Red
-
+
POWER/ DEFLECTION P.W.B.
(01/03)reference From POWER/DEF.P.W.B.
Y2
(01/03)reference From SIGNAL P.W.B.
Y1
SIGNAL P.W.B.
FOCUS(G)
FOCUS(B)
P31
P31
P31
GR
Y2
R2
SCREEN (R)
GR
BG
CPT P.W.B.(B)
(G) SCREEN
G2
R2
Y1
BG
SCREEN(B)
G2
CPT P.W.B.(B)
CPT P.W.B.(B)
R2
GR
R2
BG
N006
purse lock 11.5Ø
GR R2
SCREEN(R)
SCREEN(G)
purse lock
N006 11.5Ø
BG G2
SCREEN(B)
(02/03) reference
FOCUS PACK
BFPK
From POWER/DEFLECTION P.W.B. (02/03)reference
RC RR
RC RR
RC
RR
RR
RC
ANALOG CONVERGENCE CORR. P.W.B.
red
brown
Terminal base : Red
Terminal base : white
+
-
U404
Woofer(R)
FRONT SIDE

EXPLODED VIEW 50EX14BV (1/3)


15
26
12
19
3
45
13
24
27
15
15
15
33
35
15
54
38
29
15
30
34
15
STANDOFF
47
23
2

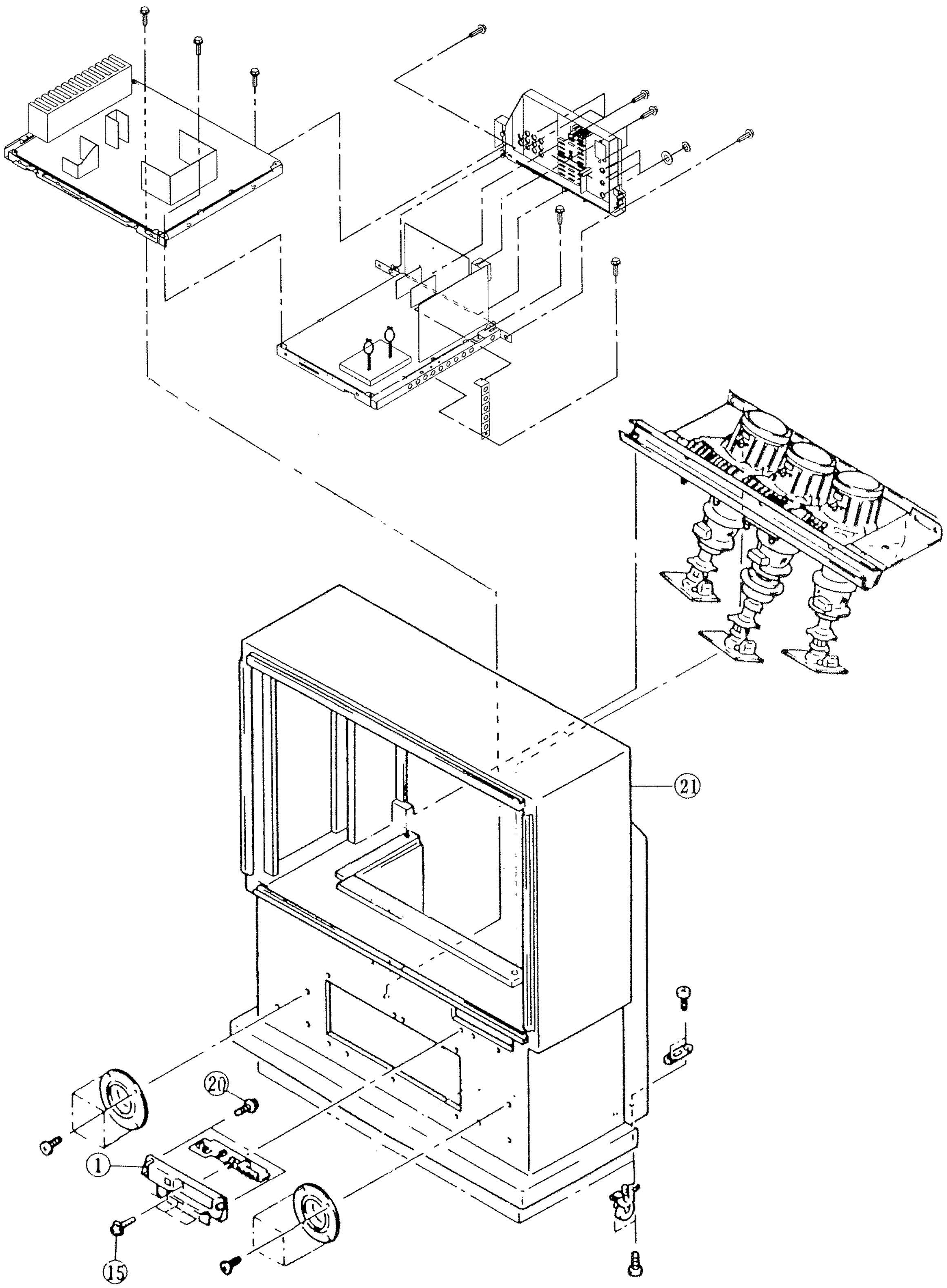
Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW 55EX15K (1/3)


22
55
13
15
23
45
55
15
56
27
15
15
15
28
30
15
34
30
29
47
15

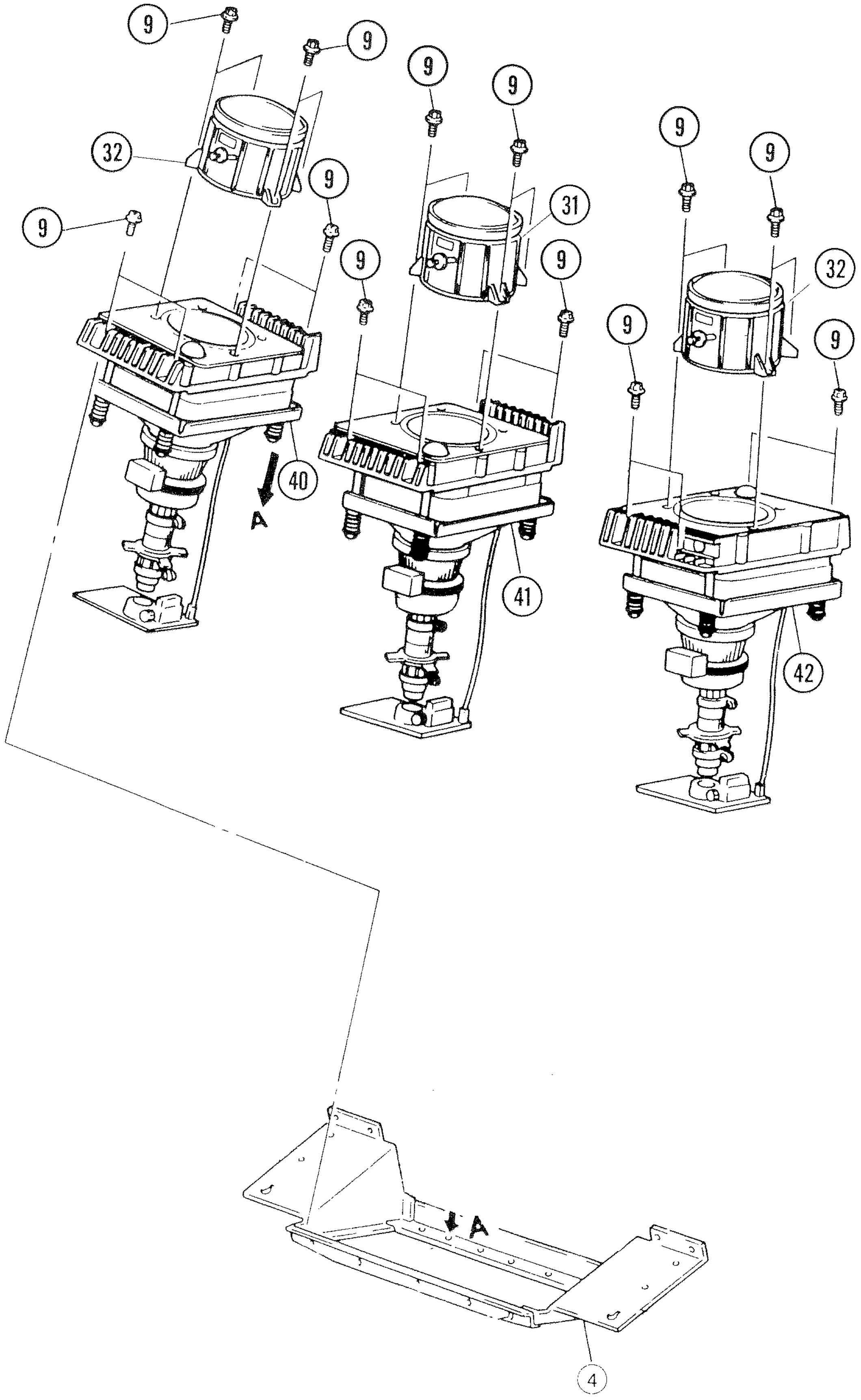
Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW (2/3)



Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW (3/3)


9
9
9
9
9
9
9
9
9
9
9
9
9
32
31
32
40
41
42
A
A
4

Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

REPLACEMENT PARTS LIST

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

ABBREVIATIONS

Capacitors:
CD: Ceramic Disc
PF: Polyester Film
EL: Electrolytic
PP: Polypropylene
PR: Paper
TA: Tantalum
TM: Trimmer

Resistors:
CF: Carbon Film
CC: Carbon Composition
MF: Metal Oxide Film
VR: Variable Resistor
WW: Wire Wound
FR: Fuse Resistor
MG: Metal Glaze

Semiconductors:
TR: Transistor
DI: Diode
ZD: Zener Diode
VA: Varistor
TH: Thermistor
IC: Integrated Circuit

CIRCUIT BLOCK	SECOND CHARACTER OF SYMBOL NO.	CIRCUIT BLOCK	SECOND CHARACTER OF SYMBOL NO.
Channel Management	0 or M	Horizontal	7 or H
Tuner	1 or T	CPT	8 or D
Signal	2 or S	Power	9 or P
Y-signal	3 or Y	Red	R
Audio	4 or A	Green	G
Color	5 or C	Blue	B
Vertical	6 or V	New & Others	EFJKLQUWXZ

SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
		CAPACITORS	CK25	0890087	CD 1000PF +-10% 50V
			CK27	0258175	EL 470MF 50V
CA01	0800003	EL 1MF 50V	CK28	0258175	EL 470MF 50V
CA02	0800003	EL 1MF 50V	CK29	0248688	CD 150PF +-5% 50V
CA05	0800003	EL 1MF 50V	CK30	0248688	CD 150PF +-5% 50V
CA06	0800003	EL 1MF 50V	CK31	0248688	CD 150PF +-5% 50V
CA07	0800003	EL 1MF 50V	CK32	0248688	CD 150PF +-5% 50V
CA08	0800003	EL 1MF 50V	CK33	0248688	CD 150PF +-5% 50V
CA26	0800015	EL 10MF 16V	CK34	0248688	CD 150PF +-5% 50V
CA27	0800015	EL 10MF 16V	CK35	0800317	EL 47MF 16V
CA28	0800015	EL 10MF 16V	CK36	0800317	EL 47MF 16V
CA29	0800015	EL 10MF 16V	CK37	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CA34	0800015	EL 10MF 16V	CK38	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CA37	0800015	EL 10MF 16V	CK39	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CA38	0800041	EL 47MF 16V	CK40	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CA40	0800015	EL 10MF 16V	CK44	0244118	CD 470PF +-10% 50V
CA41	0800015	EL 10MF 16V	CK46	0880044	PF 0.01MF +-10% 50V
CC02	0244171	CD 0.01MF +80-20% 50V	CK47	0880044	PF 0.01MF +-10% 50V
CC03	0890063	CD 15PF +-5% 50V	CK51	0800321	EL 47MF 50V
CC04	0244171	CD 0.01MF +80-20% 50V	CK52	0800321	EL 47MF 50V
CC05	0244171	CD 0.01MF +80-20% 50V	CK53	0800321	EL 47MF 50V
CC06	0800049	EL 100MF 16V	CK54	0800321	EL 47MF 50V
CF01	0800317	EL 47MF 16V	CK55	0800321	EL 47MF 50V
CF02	0800353R	EL 470MF 16V	CK56	0800321	EL 47MF 50V
CF03	0252396	EL 10MF 16V	CM01	0800023	EL 22MF 16V
CF04	0800291	EL 10MF 16V	CM02	0244171	CD 0.01MF +80-20% 50V
CF05	0276721	PF 0.22MF 50V +-5%	CM03	0800003	EL 1MF 50V
CF06	0800291	EL 10MF 16V	CM04	0244171	CD 0.01MF +80-20% 50V
CF07	0880041	PF 5600PF +-10% 50V	CM05	0244171	CD 0.01MF +80-20% 50V
CF08	0244120	CD 820PF +-10% 50V	CN01	0800279R	EL 1MF 50V
CF09	0284642R	EL 10MF 50V	CN02	0800288R	EL 4.7MF 50V
CF10	0890083	CD 470PF +-10% 50V	CN03	0880051	PF 0.033MF +-10% 50V
CF11	0800291	EL 10MF 16V	CN04	0890084	CD 560PF +-10% 50V
CF12	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)	CN05	0800041	EL 47MF 16V
CF13	0890082R	CD 390PF +-10% 50V	CN06	0800018	EL 10MF 50V
CF14	0800353R	EL 470MF 16V	CT01	0244136	CD 270PF +-10% 50V
CF15	0252396	EL 10MF 16V	CT02	0800041	EL 47MF 16V
CF16	0800291	EL 10MF 16V	CT03	0244141	CD 0.01MF +-10% 50V
CF17	0244109	CD 4700PF +-10% 50V	CT04	0244141	CD 0.01MF +-10% 50V
CK06	0800326	EL 100MF 16V	CT05	0800041	EL 47MF 16V
CK07	0800326	EL 100MF 16V	CT06	0244229	CD 150PF +-10% 50V
CK15	0890087	CD 1000PF +-10% 50V	CT07	0244141	CD 0.01MF +-10% 50V
CK17	0890087	CD 1000PF +-10% 50V	CT08	0800041	EL 47MF 16V
CK19	0890087	CD 1000PF +-10% 50V	CT09	0880005	PF 2200PF +-10% 50V
CK21	0890087	CD 1000PF +-10% 50V	CT10	0800003	EL 1MF 50V
CK23	0890087	CD 1000PF +-10% 50V	CT11	0299001	PP 0.001MF +-2% 100V

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PART NO.	PART DESCRIPTION
CT12	0800001	EL 0.47MF 50V
CT13	0800003	EL 1MF 50V
CT14	0299029	PP 0.015MF +-2% 100V
CT15	0880011	PF 0.015MF +-10% 50V
CT16	0880011	PF 0.015MF +-10% 50V
CT17	0800015	EL 10MF 16V
CT18	0800015	EL 10MF 16V
CT19	0800003	EL 1MF 50V
CT20	0800003	EL 1MF 50V
CT21	0800003	EL 1MF 50V
CT22	0800003	EL 1MF 50V
CT23	0800003	EL 1MF 50V
CT24	0800015	EL 10MF 16V
CT25	0800015	EL 10MF 16V
CT26	0800049	EL 100MF 16V
CT27	0880001	PF 680PF +-10% 50V
CT28	0880001	PF 680PF +-10% 50V
CT29	0880016	PF 0.1MF +-10% 50V
CT31	0800015	EL 10MF 16V
CT32	0880014	PF 0.047MF +-10% 50V
CT33	0800015	EL 10MF 16V
CT34	0800015	EL 10MF 16V
CT35	0800015	EL 10MF 16V
CT36	0800049	EL 100MF 16V
CT37	0800003	EL 1MF 50V
CT38	0800003	EL 1MF 50V
CT39	0800003	EL 1MF 50V
CT40	0800003	EL 1MF 50V
CT41	0800015	EL 10MF 16V
CT42	0800015	EL 10MF 16V
CT43	0800015	EL 10MF 16V
CT44	0800003	EL 1MF 50V
CT45	0800015	EL 10MF 16V
CT46	0800015	EL 10MF 16V
CT47	0284638	EL 10MF 16V
CT48	0800003	EL 1MF 50V
CT49	0880012	PF 0.022MF +-10% 50V
CT51	0800003	EL 1MF 50V
CT52	0880014	PF 0.047MF +-10% 50V
CT60	0800003	EL 1MF 50V
CT61	0880013	PF 0.033MF +-10% 50V
CT66	0284623R	EL 1MF 50V
CT67	0284623R	EL 1MF 50V
CT68	0284623R	EL 1MF 50V
CT69	0284623R	EL 1MF 50V
CT70	0284623R	EL 1MF 50V
CT71	0284623R	EL 1MF 50V
CT72	0284436R	EL 100MF 35V
CW09	0800049	EL 100MF 16V
CW10	0800023	EL 22MF 16V
CW11	0276717	PF 0.1MF 50V +-5%
CW12	0800003	EL 1MF 50V
CW13	0800009	EL 4.7MF 25V
CW14	0800005	EL 2.2MF 50V
CW15	0276717	PF 0.1MF 50V +-5%
CW16	0880053	PF 0.047MF +-10% 50V
CW17	0800001	EL 0.47MF 50V
CW18	0276717	PF 0.1MF 50V +-5%
CW19	0800003	EL 1MF 50V
CW20	0800003	EL 1MF 50V
CW21	0800003	EL 1MF 50V
CW22	0292712F	TA 3.3MF 16V
CW23	0292714F	TA 10MF +-10% 16V
CW24	0800003	EL 1MF 50V
CW25	0800003	EL 1MF 50V
CY01	0800023	EL 22MF 16V
CY04	0800023	EL 22MF 16V
CY05	0800023	EL 22MF 16V
CY06	0800023	EL 22MF 16V
CY07	0800023	EL 22MF 16V
CY08	0800049	EL 100MF 16V
CY09	0276717	PF 0.1MF 50V +-5%
CY12	0800049	EL 100MF 16V
CY14	0800074	EL 470MF 16V
CY17	0800041	EL 47MF 16V
C001	0276717	PF 0.1MF 50V +-5%
C002	0800047	EL 100MF 6.3V
C003	0276717	PF 0.1MF 50V +-5%
C004	0890067	CD 33PF +-5% 50V
C005	0244171	CD 0.01MF +80-20% 50V
C006	0800015	EL 10MF 16V
C007	0890067	CD 33PF +-5% 50V
C010	0800009	EL 4.7MF 25V
C011	0800009	EL 4.7MF 25V
C012	0800009	EL 4.7MF 25V
C013	0800009	EL 4.7MF 25V
C014	0800009	EL 4.7MF 25V
C015	0880012	PF 0.022MF +-10% 50V
C016	0800009	EL 4.7MF 25V
C017	0800009	EL 4.7MF 25V
C018	0800047	EL 100MF 6.3V
C019	0276717	PF 0.1MF 50V +-5%
C020	0890085	CD 680PF +-10% 50V
C021	0800015	EL 10MF 16V
C022	0890071	CD 56PF +-5% 50V
C023	0890074	CD 100PF +-5% 50V
C024	0890087	CD 1000PF +-10% 50V
C025	0800047	EL 100MF 6.3V
C026	0276717	PF 0.1MF 50V +-5%
C027	0800023	EL 22MF 16V
C031	0800048	EL 100MF 10V
C032	0800015	EL 10MF 16V
C034	0800074	EL 470MF 16V
C035	0276717	PF 0.1MF 50V +-5%
C036	0800009	EL 4.7MF 25V
C037	0800049	EL 100MF 16V
C038	0276717	PF 0.1MF 50V +-5%
C039	0800075	EL 470MF 25V
C040	0243503	CD 150PF +-10% 500V
C041	0800003	EL 1MF 50V
C042	0800003	EL 1MF 50V
C045	0880018	PF 0.22MF +-10% 50V
C046	0800005	EL 2.2MF 50V
C301	0276717	PF 0.1MF 50V +-5%
C302	0800015	EL 10MF 16V
C303	0800007	EL 3.3MF 50V
C305	0800003	EL 1MF 50V
C306	0244171	CD 0.01MF +80-20% 50V
C307	0244171	CD 0.01MF +80-20% 50V
C308	0244171	CD 0.01MF +80-20% 50V
C309	0244171	CD 0.01MF +80-20% 50V
C310	0244171	CD 0.01MF +80-20% 50V
C311	0244171	CD 0.01MF +80-20% 50V
C313	0800015	EL 10MF 16V
C314	0800003	EL 1MF 50V
C315	0244171	CD 0.01MF +80-20% 50V
C317	0800003	EL 1MF 50V
C318	0800003	EL 1MF 50V
C319	0800005	EL 2.2MF 50V
C323	0880046	PF 0.015MF +-10% 50V
C324	0800003	EL 1MF 50V
C325	0880033	PF 1500PF +-10% 50V
C326	0800003	EL 1MF 50V
C327	0800049	EL 100MF 16V
C328	0244171	CD 0.01MF +80-20% 50V
C329	0800009	EL 4.7MF 25V
C330	0800049	EL 100MF 16V
C331	0800058	EL 220MF 16V
C332	0800015	EL 10MF 16V
C333	0880046	PF 0.015MF +-10% 50V
C334	0880051	PF 0.033MF +-10% 50V
C335	0880037	PF 3300PF +-10% 50V
C336	0276717	PF 0.1MF 50V +-5%
C337	0880037	PF 3300PF +-10% 50V
C338	0890079R	CD 270PF +-10% 50V
C339	0880037	PF 3300PF +-10% 50V

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SYMBOL NO.	PART NO.	PART DESCRIPTION
C340	0800003	EL 1MF 50V
C406	0890087	CD 1000PF +-10% 60V
C407	0800015	1EL 10MF 16V
C409	8900887	CD 1000PF +- 10% 50V
C411	0500015	EL 10MF 16V
C419	0880051	PF 0.033MF +-10% 50V
C420	0880041	PF 5600PF +-10% 50V
C421	0880051	PF 0.033MF +-10% 50V
C422	0880041	PF 5600PF +-10% 50V
C427	0800003	EL 1MF 50V
C428	0800003	EL 1MF 50V
C432	0800015	EL 10MF 16V
C433	0800003	EL 1MF 50V
C434	0800003	EL 1MF 50V
C435	0890087	CD 1000PF +-10% 50V
C436	0890087	CD 1000PF +-10% 50V
C437	0800042	EL 47MF 25V
C438	0800042	EL 47MF 25V
C439	0800051	EL 100MF 25V
C440	0800003	EL 1MF 50V
C441	0800003	EL 1MF 50V
C442	0800051	EL 100MF 25V
C443	0253934	EL 2200MF 35V
C444	0276717	PF 0.1MF 50V +-5%
C445	0276717	PF 0.1MF 50V +-5%
C446	0253934	EL 2200MF 35V
C447	0253934	EL 2200MF 35V
C448	0800041	EL 47MF 16V
C449	0276717	PF 0.1MF 50V +-5%
C450	0880018	PF 0.22MF +-10% 50V
C451	0800049	EL 100MF 16V
C452	0276717	PF 0.1MF 50V +-5%
C460	0800015	EL 10MF 16V
C461	0800015	EL 10MF 16V
C501	0800001	EL 0.47MF 50V
C502	0244171	CD 0.01MF +80-20% 50V
C503	0244171	CD 0.01MF +80-20% 50V
C504	0800058	EL 220MF 16V
C505	0890116	CD 15PF +-5% 50V
C507	0800003	EL 1MF 50V
C508	0800003	EL 1MF 50V
C509	0800003	EL 1MF 50V
C511	0244171	CD 0.01MF +80-20% 50V
C512	0244171	CD 0.01MF +80-20% 50V
C513	0244171	CD 0.01MF +80-20% 50V
C515	0244171	CD 0.01MF +80-20% 50V
C516	0244171	CD 0.01MF +80-20% 50V
C519	0800015	EL 10MF 16V
C521	0244171	CD 0.01MF +80-20% 50V
C525	0880044	PF 0.01MF +-10% 50V
C526	0276717	PF 0.1MF 50V +-5%
C527	0800075	EL 470MF 25V
C528	0276717	PF 0.1MF 50V +-5%
C532	0276717	PF 0.1MF 50V +-5%
C533	0800075	EL 470MF 25V
C534	0276717	PF 0.1MF 50V +-5%
C535	0800049	EL 100MF 16V
C536	0800075	EL 470MF 25V
C603	0800345	EL 330MF 25V
C604	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C606	0298261R	TA 1MF +-10% 35V
C607	0284446R	EL 1MF 50V
C608	0800368	EL 2200MF 25V
C609	0800347N	EL 330MF 50V
C610	0800326	EL 100MF 16V
C611	0800347N	EL 330MF 50V
C612	0880051	PF 0.033MF +-10% 50V
C613	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C614	0279859	PF 0.1MF +-10% 100V
C617	0284446R	EL 1MF 50V
C619	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C620	0800291	EL 10MF 16V
C622	0800041	EL 47MF 16V
C623	0800041	EL 47MF 16V
C701	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C702	0243507	CD 330PF +-10% 500V
C703	0244501	CD 1000PF +-10% 500V
C704	0259153	EL 220MF 160V
C705	0299926	PP 0.1MF +-10% 200V
C706	0890028	CD 330PF +-10% 50V
⚠ C708	0262414F	PP 3300PF +-5% 1800V (HHEA MD)
⚠ C709	0262426F	PP 9100PF +-5% 1.8KV
C710	0299931	PP 0.27MF +-10% 200V
C711	0299932	PP 0.33MF +-10% 200V
⚠ C715	0299720	PP 0.015MF +-5% 630V
C717	0259471	EL 6.8MF 50V
C718	0299636	PP 0.068MF +-5% 1600V
C720	0243503	CD 150PF +-10% 500V
C721	0253983F	EL 33MF
C722	0800329	EL 100MF 50V
C723	0880057	PF 0.1MF +-10% 50V
C724	0890087	CD 1000PF +-10% 50V
C725	0800279R	EL 1MF 50V
C726	0244109	CD 4700PF +-10% 50V
C727	0880048	PF 0.022MF +-10% 50V
C728	0890089	CD 1500PF +-10% 50V
C729	0800282	EL 2.2MF 50V
C730	0284634R	EL 4.7MF 50V
C731	0244501	CD 1000PF +-10% 500V
C732	0243508	CD 390PF +-10% 500V
C733	0243509	CD 470PF +-10% 500V
C735	0880031	PF 1000PF +-10% 50V
C738	0243503	CD 150PF +-10% 500V
C739	0890083	CD 470PF +-10% 50V
C740	0890084	CD 560PF +-10% 50V
⚠ C741	0246348	CD 220PF +-10% 2KV (HHEA MD)
C804	0244889	CD 2200PF +-10% 2KV
C805	0800326	EL 100MF 16V
C807	0244139	CD 1000PF +-10% 50V
C808	0244139	CD 1000PF +-10% 50V
C810	0800326	EL 100MF 16V
C831	0257543	EL 3.3MF 315V
C834	0244889	CD 2200PF +-10% 2KV
C835	0800326	EL 100MF 16V
C837	0244139	CD 1000PF +-10% 50V
C838	0244139	CD 1000PF +-10% 50V
C864	0244889	CD 2200PF +-10% 2KV
C865	0800326	EL 100MF 16V
C867	0244139	CD 1000PF +-10% 50V
C868	0890086	CD 820PF +-10% 50V
⚠ C901	AN00148S	PF 0.22MF +-20% 250V (HHEA MD)
⚠ C902	AN00144S	PF 0.1MF +-20% 250V (HHEA MD)
C903	0248593F	CD 4700PF +80-20% 250V
C904	0248593F	CD 4700PF +80-20% 250V
C905	0248593F	CD 4700PF +80-20% 250V
C906	0248593F	CD 4700PF +80-20% 250V
C907	0259167	EL 820MF 200V
C908	0259167	EL 820MF 200V
C911	0890087	CD 1000PF +-10% 50V
C912	0800059	EL 220MF 25V
C913	0299981	PP 0.01MF +-5% 630V
C914	0880044	PF 0.01MF +-10% 50V
C915	0880037	PF 3300PF +-10% 50V
C916	0880031	PF 1000PF +-10% 50V
C917	0800286R	EL 4.7MF 25V
C918	0880057	PF 0.1MF +-10% 50V
C920	0285221	EL 1000MF 35V
C921	0285221	EL 1000MF 35V
C922	0285221	EL 1000MF 35V
C924	0285224	EL 2200MF 25V
C925	0285224	EL 2200MF 25V
C926	0258697	EL 470MF 160V
C927	0880044	PF 0.01MF +-10% 50V
C928	0244105	CD 2200PF +-10% 50V
C930	0284436R	EL 100MF 35V
C931	0284436R	EL 100MF 35V
C933	0800326	EL 100MF 16V

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SYMBOL NO.	PART NO.	PART DESCRIPTION
C935	0284436R	EL 100MF 35V
C936	0284405R	EL 220MF 16V
C937	0284405R	EL 220MF 16V
C939	0284436R	EL 100MF 35V
C942	0800326	EL 100MF 16V
C943	0800279R	EL 1MF 50V
C944	0800317	EL 47MF 16V
C945	0284647R	EL 22MF 16V
C947	0258121R	EL 2.2MF 100V
C954	0800363	EL 1000MF 35V
C955	0800317	EL 47MF 16V
C956	0800082	EL 1000MF 16V
C957	0800331R	EL 100MF 63V
C958	0800331R	EL 100MF 63V
C960	0880057	PF 0.1MF +-10% 50V
C967	0880062	PF 0.22MF +-10% 50V
C968	0880062	PF 0.22MF +-10% 50V
C969	0880062	PF 0.22MF +-10% 50V
C972	0800291	EL 10MF 16V
C973	0800083	EL 1000MF 25V
		RESISTORS
RA01	0700051	CF 5.6K OHM +-5% 1/16W
RA02	0700051	CF 5.6K OHM +-5% 1/16W
RA05	0700051	CF 5.6K OHM +-5% 1/16W
RA06	0700051	CF 5.6K OHM +-5% 1/16W
RA07	0700051	CF 5.6K OHM +-5% 1/16W
RA08	0700051	CF 5.6K OHM +-5% 1/16W
RA11	0700027	CF 100 OHM +-5% 1/16W
RA12	0700027	CF 100 OHM +-5% 1/16W
RA18	0700062	CF 39K OHM +-5% 1/16W
RA19	0700054	CF 10K OHM +-5% 1/16W
RA20	0700041	CF 1K OHM +-5% 1/16W
RA21	0700041	CF 1K OHM +-5% 1/16W
RA22	0700034	CF 330 OHM +-5% 1/16W
RA23	0700032	CF 220 OHM +-5% 1/16W
RA24	0700062	CF 39K OHM +-5% 1/16W
RA25	0700054	CF 10K OHM +-5% 1/16W
RA26	0700041	CF 1K OHM +-5% 1/16W
RA27	0700041	CF 1K OHM +-5% 1/16W
RA28	0700034	CF 330 OHM +-5% 1/16W
RA29	0700032	CF 220 OHM +-5% 1/16W
RA30	0700041	CF 1K OHM +-5% 1/16W
RA31	0700067	CF 100K OHM +-5% 1/16W
RA32	0700041	CF 1K OHM +-5% 1/16W
RA33	0700067	CF 100K OHM +-5% 1/16W
RA50	0700041	CF 1K OHM +-5% 1/16W
RA51	0700067	CF 100K OHM +-5% 1/16W
RA52	0700041	CF 1K OHM +-5% 1/16W
RA53	0700067	CF 100K OHM +-5% 1/16W
RA58	0700041	CF 1K OHM +-5% 1/16W
RA59	0700067	CF 100K OHM +-5% 1/16W
RA60	0700041	CF 1K OHM +-5% 1/16W
RA61	0700067	CF 100K OHM +-5% 1/16W
RA64	0100123	CF 270K OHM +-5% 1/8W
RA65	0100123	CF 270K OHM +-5% 1/8W
RA66	0100123	CF 270K OHM +-5% 1/8W
RA67	0100123	CF 270K OHM +-5% 1/8W
RC02	0700027	CF 100 OHM +-5% 1/16W
RC03	0700027	CF 100 OHM +-5% 1/16W
RC04	0700027	CF 100 OHM +-5% 1/16W
RC05	0700027	CF 100 OHM +-5% 1/16W
RC06	0700037	CF 560 OHM +-5% 1/16W
RC07	0700032	CF 220 OHM +-5% 1/16W
RC08	0700032	CF 220 OHM +-5% 1/16W
RC09	0700056	CF 15K OHM +-5% 1/16W
RC10	0700055	CF 12K OHM +-5% 1/16W
RC11	0700027	CF 100 OHM +-5% 1/16W
RC12	0700027	CF 100 OHM +-5% 1/16W
RC13	0700053	CF 8.2K OHM +-5% 1/16W
RC14	0700057	CF 18K OHM +-5% 1/16W
RC15	0700041	CF 1K OHM +-5% 1/16W

SYMBOL NO.	PART NO.	PART DESCRIPTION
RC16	0100038	CF 75 OHM +-5% 1/8W
RC18	0700027	CF 100 OHM +-5% 1/16W
RC19	0700039	CF 820 OHM +-5% 1/16W
RF01	0110279	MF 27K OHM +-5% 2W
RF02	0110279	MF 27K OHM +-5% 2W
RF03	0110279	MF 27K OHM +-5% 2W
RF04	0110279	MF 27K OHM +-5% 2W
RF05	0110279	MF 27K OHM +-5% 2W
RF06	0114213	CF 33K OHM +-5% 1/4W
RF07	0100065	CF 1K OHM +-5% 1/8W
RF08	0100041	CF 100 OHM +-5% 1/8W
RF09	0700035	CF 390 OHM +-5% 1/16W
RF10	0700045	CF 2.2K OHM +-5% 1/16W
RF11	0700059	CF 27K OHM +-5% 1/16W
RF12	0700059	CF 27K OHM +-5% 1/16W
RF13	0700053	CF 8.2K OHM +-5% 1/16W
RF14	0700047	CF 3.3K OHM +-5% 1/16W
RF15	0700046	CF 2.7K OHM +-5% 1/16W
RF16	0700049	CF 4.7K OHM +-5% 1/16W
RF17	0700027	CF 100 OHM +-5% 1/16W
RF18	0700054	CF 10K OHM +-5% 1/16W
RF19	0700037	CF 560 OHM +-5% 1/16W
RF20	0700066	CF 82K OHM +-5% 1/16W
RF21	0700049	CF 4.7K OHM +-5% 1/16W
RF22	0700059	CF 27K OHM +-5% 1/16W
RF23	0700043	CF 1.5K OHM +-5% 1/16W
RF24	0700051	CF 5.6K OHM +-5% 1/16W
RF25	0700038	CF 680 OHM +-5% 1/16W
RF26	0187098	CF 24K OHM +-5% 1/16W
RF27	0700054	CF 10K OHM +-5% 1/16W
RF28	0100113	CF 100K OHM +-5% 1/8W
RF29	0700063	CF 47K OHM +-5% 1/16W
RF30	0700046	CF 2.7K OHM +-5% 1/16W
RF31	0700041	CF 1K OHM +-5% 1/16W
RF32	0700052	CF 6.8K OHM +-5% 1/16W
RF33	0700058	CF 22K OHM +-5% 1/16W
RF34	0700058	CF 22K OHM +-5% 1/16W
RF35	0700056	CF 15K OHM +-5% 1/16W
RF36	0700053	CF 8.2K OHM +-5% 1/16W
RF37	0700041	CF 1K OHM +-5% 1/16W
RF38	0700061	CF 33K OHM +-5% 1/16W
RF39	0700049	CF 4.7K OHM +-5% 1/16W
RF40	0700054	CF 10K OHM +-5% 1/16W
RF41	0700054	CF 10K OHM +-5% 1/16W
RKA8	0700041	CF 1K OHM +-5% 1/16W
RK01	0700063	CF 47K OHM +-5% 1/16W
RK02	0700049	CF 4.7K OHM +-5% 1/16W
RK03	0100125	CF 330K OHM +-5% 1/8W
RK13	0700063	CF 47K OHM +-5% 1/16W
RK14	0110229	MF 220 OHM +-5% 2W
RK15	0113696	CF 6.8 OHM +-5% 1/2W
RK16	0113696	CF 6.8 OHM +-5% 1/2W
RK17	0100077	CF 3.3K OHM +-5% 1/8W
RK18	0700063	CF 47K OHM +-5% 1/16W
RK19	0110225	MF 150 OHM +-5% 2W
RK20	0113692	CF 4.7 OHM +-5% 1/2W
RK21	0113692	CF 4.7 OHM +-5% 1/2W
RK22	0100077	CF 3.3K OHM +-5% 1/8W
RK23	0700063	CF 47K OHM +-5% 1/16W
RK24	0110229	MF 220 OHM +-5% 2W
RK25	0113696	CF 6.8 OHM +-5% 1/2W
RK26	0113696	CF 6.8 OHM +-5% 1/2W
RK27	0100077	CF 3.3K OHM +-5% 1/8W
RK28	0700063	CF 47K OHM +-5% 1/16W
RK29	0110225	MF 150 OHM +-5% 2W
RK30	0113698	CF 8.2 OHM +-5% 1/2W
RK31	0113698	CF 8.2 OHM +-5% 1/2W
RK32	0100077	CF 3.3K OHM +-5% 1/8W
RK33	0700063	CF 47K OHM +-5% 1/16W
RK34	0110229	MF 220 OHM +-5% 2W
RK35	0113696	CF 6.8 OHM +-5% 1/2W
RK36	0113696	CF 6.8 OHM +-5% 1/2W
RK37	0100077	CF 3.3K OHM +-5% 1/8W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RK38	0100077	CF 3.3K OHM +-5% 1/8W
RK39	0700063	CF 47K OHM +-5% 1/16W
RK40	0110225	MF 150 OHM +-5% 2W
RK41	0113692	CF 4.7 OHM +-5% 1/2W
RK42	0113692	CF 4.7 OHM +-5% 1/2W
RK43	0700032	CF 220 OHM +-5% 1/16W
RK44	0700032	CF 220 OHM +-5% 1/16W
RK45	0700032	CF 220 OHM +-5% 1/16W
RK46	0700032	CF 220 OHM +-5% 1/16W
RK47	0700032	CF 220 OHM +-5% 1/16W
RK48	0700032	CF 220 OHM +-5% 1/16W
RK49	0700032	CF 220 OHM +-5% 1/16W
RK50	0700032	CF 220 OHM +-5% 1/16W
RK51	0700032	CF 220 OHM +-5% 1/16W
RK52	0700032	CF 220 OHM +-5% 1/16W
RK53	0700044	CF 1.8K OHM +-5% 1/16W
RK54	0700041	CF 1K OHM +-5% 1/16W
RK55	0700041	CF 1K OHM +-5% 1/16W
RK56	0700041	CF 1K OHM +-5% 1/16W
RK59	0700051	CF 5.6K OHM +-5% 1/16W
RK60	0700048	CF 3.9K OHM +-5% 1/16W
RK61	0700051	CF 5.6K OHM +-5% 1/16W
RK62	0700049	CF 4.7K OHM +-5% 1/16W
RK63	0700051	CF 5.6K OHM +-5% 1/16W
RK64	0700049	CF 4.7K OHM +-5% 1/16W
RK65	0700051	CF 5.6K OHM +-5% 1/16W
RK66	0700051	CF 5.6K OHM +-5% 1/16W
RK67	0700057	CF 18K OHM +-5% 1/16W
RK68	0700046	CF 2.7K OHM +-5% 1/16W
RK69	0700062	CF 39K OHM +-5% 1/16W
RK70	0700057	CF 18K OHM +-5% 1/16W
RK71	0700046	CF 2.7K OHM +-5% 1/16W
RK72	0700062	CF 39K OHM +-5% 1/16W
RK73	0700057	CF 18K OHM +-5% 1/16W
RK74	0700049	CF 4.7K OHM +-5% 1/16W
RK75	0700062	CF 39K OHM +-5% 1/16W
RK76	0700057	CF 18K OHM +-5% 1/16W
RK77	0700049	CF 4.7K OHM +-5% 1/16W
RK78	0700062	CF 39K OHM +-5% 1/16W
RM01	0700041	CF 1K OHM +-5% 1/16W
RM02	0700058	CF 22K OHM +-5% 1/16W
RM03	0700045	CF 2.2K OHM +-5% 1/16W
RM04	0100065	CF 1K OHM +-5% 1/8W
RM05	0100065	CF 1K OHM +-5% 1/8W
RM06	0700041	CF 1K OHM +-5% 1/16W
RM07	0700043	CF 1.5K OHM +-5% 1/16W
RM08	0700046	CF 2.7K OHM +-5% 1/16W
RM09	0700049	CF 4.7K OHM +-5% 1/16W
RM10	0100129	CF 470K OHM +-5% 1/8W
RM11	0700041	CF 1K OHM +-5% 1/16W
RM12	0100125	CF 330K OHM +-5% 1/8W
RM13	0114149	CF 560 OHM +-5% 1/4W
RM14	0100125	CF 330K OHM +-5% 1/8W
RM15	0700054	CF 10K OHM +-5% 1/16W
RN01	0700057	CF 18K OHM +-5% 1/16W
RN02	0700041	CF 1K OHM +-5% 1/16W
RN03	0700041	CF 1K OHM +-5% 1/16W
RN04	0700067	CF 100K OHM +-5% 1/16W
RN05	0700052	CF 6.8K OHM +-5% 1/16W
RN06	0700051	CF 5.6K OHM +-5% 1/16W
RN07	0700054	CF 10K OHM +-5% 1/16W
RN08	0700057	CF 18K OHM +-5% 1/16W
RN09	0700061	CF 33K OHM +-5% 1/16W
RN10	0700054	CF 10K OHM +-5% 1/16W
RN11	0700058	CF 22K OHM +-5% 1/16W
RN12	0700051	CF 5.6K OHM +-5% 1/16W
RN13	0700044	CF 1.8K OHM +-5% 1/16W
RN14	0700054	CF 10K OHM +-5% 1/16W
RN15	0700058	CF 22K OHM +-5% 1/16W
RN16	0700064	CF 56K OHM +-5% 1/16W
RN18	0700057	CF 18K OHM +-5% 1/16W
RN19	0700049	CF 4.7K OHM +-5% 1/16W
RSA1	0147152	WW 27 OHM +-5% 3W
RTA2	0700064	CF 56K OHM +-5% 1/16W
RTA3	0700057	CF 18K OHM +-5% 1/16W
RTA7	0700067	CF 100K OHM +-5% 1/16W
RTA8	0700058	CF 22K OHM +-5% 1/16W
RTA9	0700061	CF 33K OHM +-5% 1/16W
RTE1	0700067	CF 100K OHM +-5% 1/16W
RTE2	0700058	CF 22K OHM +-5% 1/16W
RTE3	0700061	CF 33K OHM +-5% 1/16W
RTE4	0700063	CF 47K OHM +-5% 1/16W
RTE5	0700063	CF 47K OHM +-5% 1/16W
RTE6	0700067	CF 100K OHM +-5% 1/16W
RTE7	0700062	CF 39K OHM +-5% 1/16W
RTE8	0700063	CF 47K OHM +-5% 1/16W
RTE9	0700063	CF 47K OHM +-5% 1/16W
RTF1	0700067	CF 100K OHM +-5% 1/16W
RTF2	0700062	CF 39K OHM +-5% 1/16W
RTF3	0700041	CF 1K OHM +-5% 1/16W
RTF4	0700041	CF 1K OHM +-5% 1/16W
RTF5	0700049	CF 4.7K OHM +-5% 1/16W
RTF6	0700041	CF 1K OHM +-5% 1/16W
RTF7	0700041	CF 1K OHM +-5% 1/16W
RTF8	0700049	CF 4.7K OHM +-5% 1/16W
RTF9	0700041	CF 1K OHM +-5% 1/16W
RTG1	0700041	CF 1K OHM +-5% 1/16W
RTG2	0700049	CF 4.7K OHM +-5% 1/16W
RTG3	0700041	CF 1K OHM +-5% 1/16W
RTG4	0700041	CF 1K OHM +-5% 1/16W
RTG5	0700049	CF 4.7K OHM +-5% 1/16W
RTG6	0700041	CF 1K OHM +-5% 1/16W
RTG7	0700041	CF 1K OHM +-5% 1/16W
RTG8	0700054	CF 10K OHM +-5% 1/16W
RTG9	0700041	CF 1K OHM +-5% 1/16W
RTH1	0700041	CF 1K OHM +-5% 1/16W
RTH2	0700052	CF 6.8K OHM +-5% 1/16W
RTH3	0700041	CF 1K OHM +-5% 1/16W
RTH4	0700041	CF 1K OHM +-5% 1/16W
RTH5	0700066	CF 82K OHM +-5% 1/16W
RTH6	0700041	CF 1K OHM +-5% 1/16W
RTH7	0700041	CF 1K OHM +-5% 1/16W
RTH8	0700066	CF 82K OHM +-5% 1/16W
RTH9	0700032	CF 220 OHM +-5% 1/16W
RTJ1	0700032	CF 220 OHM +-5% 1/16W
RTJ2	0700032	CF 220 OHM +-5% 1/16W
RTJ3	0700056	CF 15K OHM +-5% 1/16W
RTJ4	0700032	CF 220 OHM +-5% 1/16W
RTJ5	0700032	CF 220 OHM +-5% 1/16W
RTJ6	0700056	CF 15K OHM +-5% 1/16W
RTJ7	0700032	CF 220 OHM +-5% 1/16W
RTJ8	0700044	CF 1.8K OHM +-5% 1/16W
RTJ9	0700049	CF 4.7K OHM +-5% 1/16W
RTK1	0700048	CF 3.9K OHM +-5% 1/16W
RT01	0700027	CF 100 OHM +-5% 1/16W
RT02	0700051	CF 5.6K OHM +-5% 1/16W
RT03	0700027	CF 100 OHM +-5% 1/16W
RT04	0700054	CF 10K OHM +-5% 1/16W
RT05	0119514	FR 10 OHM +-5% 1/4W
RT06	0119514	FR 10 OHM +-5% 1/4W
RT07	0700049	CF 4.7K OHM +-5% 1/16W
RT08	0700046	CF 2.7K OHM +-5% 1/16W
RT09	0187092	CF 13K OHM+-5% 1/16W
RT10	0700054	CF 10K OHM +-5% 1/16W
RT11	0700045	CF 2.2K OHM +-5% 1/16W
RT12	0700065	CF 68K OHM +-5% 1/16W
RT13	0700054	CF 10K OHM +-5% 1/16W
RT14	0187080	CF 4.3K OHM +-5% 1/16W
RT15	0187072	CF 2K OHM +-5% 1/16W
RT16	0100087	CF 8.2K OHM +-5% 1/8W
RT17	0100121	CF 220K OHM +-5% 1/8W
RT18	0114161	CF 1K OHM +-5% 1/4W
RT19	0700049	CF 4.7K OHM +-5% 1/16W
RT20	0700061	CF 33K OHM +-5% 1/16W
RT21	0100075	CF 2.7K OHM +-5% 1/8W
RT22	0700038	CF 680 OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RT23	0700056	CF 15K OHM +-5% 1/16W
RT24	0114177	CF 4.7K OHM +-5% 1/4W
RT25	0700047	CF 3.3K OHM +-5% 1/16W
RT26	0150134	VR 1K OHM-B
RT27	0700065	CF 68K OHM +-5% 1/16W
RT28	0700054	CF 10K OHM +-5% 1/16W
RT29	0100121	CF 220K OHM +-5% 1/8W
RT30	0187068	CF 1.3K OHM +-5% 1/16W
RT31	0700047	CF 3.3K OHM +-5% 1/16W
RT32	0700047	CF 3.3K OHM +-5% 1/16W
RT33	0700062	CF 39K OHM +-5% 1/16W
RT34	0700049	CF 4.7K OHM +-5% 1/16W
RT35	0700055	CF 12K OHM +-5% 1/16W
RT36	0700054	CF 10K OHM +-5% 1/16W
RT37	0700055	CF 12K OHM +-5% 1/16W
RT38	0700053	CF 8.2K OHM +-5% 1/16W
RT39	0700057	CF 18K OHM +-5% 1/16W
RT40	0700054	CF 10K OHM +-5% 1/16W
RT41	0700058	CF 22K OHM +-5% 1/16W
RT42	0700063	CF 47K OHM +-5% 1/16W
RT44	0700047	CF 3.3K OHM +-5% 1/16W
RT45	0700052	CF 6.8K OHM +-5% 1/16W
RT46	0700054	CF 10K OHM +-5% 1/16W
RT50	0700066	CF 82K OHM +-5% 1/16W
RT51	0700066	CF 82K OHM +-5% 1/16W
RT52	0187104	CF 43K OHM +-5% 1/16W
RT53	0700045	CF 2.2K OHM +-5% 1/16W
RT57	0700067	CF 100K OHM +-5% 1/16W
RT58	0100121	CF 220K OHM +-5% 1/8W
RT59	0100124	CF 300K OHM +-5% 1/8W
RT60	0700055	CF 12K OHM +-5% 1/16W
RT61	0700053	CF 8.2K OHM +-5% 1/16W
RT62	0187098	CF 24K OHM +-5% 1/16W
RT63	0100117	CF 150K OHM +-5% 1/8W
RT64	0700054	CF 10K OHM +-5% 1/16W
RT65	0700052	CF 6.8K OHM +-5% 1/16W
RT66	0700067	CF 100K OHM +-5% 1/16W
RT67	0114161	CF 1K OHM +-5% 1/4W
RT68	0700051	CF 5.6K OHM +-5% 1/16W
RT69	0700055	CF 12K OHM +-5% 1/16W
RT70	2340552	THERMISTOR
RT71	0700042	CF 1.2K OHM +-5% 1/16W
RT72	0700051	CF 5.6K OHM +-5% 1/16W
RT73	0700044	CF 1.8K OHM +-5% 1/16W
RT74	0700044	CF 1.8K OHM +-5% 1/16W
RT75	0700052	CF 6.8K OHM +-5% 1/16W
RT76	0700054	CF 10K OHM +-5% 1/16W
RT77	0700067	CF 100K OHM +-5% 1/16W
RT78	0100081	CF 4.7K OHM +-5% 1/8W
RT79	0700052	CF 6.8K OHM +-5% 1/16W
RT80	0700054	CF 10K OHM +-5% 1/16W
RT81	0700067	CF 100K OHM +-5% 1/16W
RT82	0700042	CF 1.2K OHM +-5% 1/16W
RT83	0700047	CF 3.3K OHM +-5% 1/16W
RT84	0700062	CF 39K OHM +-5% 1/16W
RT85	0700054	CF 10K OHM +-5% 1/16W
RT86	0700047	CF 3.3K OHM +-5% 1/16W
RT87	0700051	CF 5.6K OHM +-5% 1/16W
RT88	0700051	CF 5.6K OHM +-5% 1/16W
RT97	0700047	CF 3.3K OHM +-5% 1/16W
RT98	0700061	CF 33K OHM +-5% 1/16W
RUA1	0700045	CF 2.2K OHM +-5% 1/16W
RUA2	0700048	CF 3.9K OHM +-5% 1/16W
RUA3	0150136	VR 5K OHM-B
RUA4	0700055	CF 12K OHM +-5% 1/16W
RUA5	0700027	CF 100 OHM +-5% 1/16W
RUA6	0150136	VR 5K OHM-B
RUA7	0700047	CF 3.3K OHM +-5% 1/16W
RUA8	0700046	CF 2.7K OHM +-5% 1/16W
RUA9	0700046	CF 2.7K OHM +-5% 1/16W
RUE1	0150136	VR 5K OHM-B
RUE2	0700066	CF 82K OHM +-5% 1/16W
RUE3	0150136	VR 5K OHM-B
RUE4	0700045	CF 2.2K OHM +-5% 1/16W
RUE5	0700052	CF 6.8K OHM +-5% 1/16W
RUE6	0700054	CF 10K OHM +-5% 1/16W
RUE7	0150136	VR 5K OHM-B
RUE8	0700041	CF 1K OHM +-5% 1/16W
RUE9	0700049	CF 4.7K OHM +-5% 1/16W
RUF1	0700049	CF 4.7K OHM +-5% 1/16W
RUF2	0150136	VR 5K OHM-B
RUF3	0700042	CF 1.2K OHM +-5% 1/16W
RUF4	0700045	CF 2.2K OHM +-5% 1/16W
RUF5	0700054	CF 10K OHM +-5% 1/16W
RUF6	0150136	VR 5K OHM-B
RUF7	0700049	CF 4.7K OHM +-5% 1/16W
RUF8	0700043	CF 1.5K OHM +-5% 1/16W
RUF9	0700046	CF 2.7K OHM +-5% 1/16W
RUG1	0150136	VR 5K OHM-B
RUG2	0700052	CF 6.8K OHM +-5% 1/16W
RUG3	0700048	CF 3.9K OHM +-5% 1/16W
RUG4	0700048	CF 3.9K OHM +-5% 1/16W
RUG5	0150136	VR 5K OHM-B
RUG6	0700049	CF 4.7K OHM +-5% 1/16W
RUG7	0700049	CF 4.7K OHM +-5% 1/16W
RUG8	0700047	CF 3.3K OHM +-5% 1/16W
RUG9	0150136	VR 5K OHM-B
RUH1	0700041	CF 1K OHM +-5% 1/16W
RUH2	0700052	CF 6.8K OHM +-5% 1/16W
RUH3	0700041	CF 1K OHM +-5% 1/16W
RUH4	0150136	VR 5K OHM-B
RUH5	0700054	CF 10K OHM +-5% 1/16W
RUH6	0700046	CF 2.7K OHM +-5% 1/16W
RUH7	0700041	CF 1K OHM +-5% 1/16W
RUH8	0150136	VR 5K OHM-B
RUH9	0700051	CF 5.6K OHM +-5% 1/16W
RUJ1	0700049	CF 4.7K OHM +-5% 1/16W
RUJ2	0700046	CF 2.7K OHM +-5% 1/16W
RUJ3	0150136	VR 5K OHM-B
RUJ4	0700054	CF 10K OHM +-5% 1/16W
RUJ5	0700042	CF 1.2K OHM +-5% 1/16W
RUJ6	0700052	CF 6.8K OHM +-5% 1/16W
RUJ7	0150136	VR 5K OHM-B
RUJ8	0700066	CF 82K OHM +-5% 1/16W
RUJ9	0700051	CF 5.6K OHM +-5% 1/16W
RUK1	0700053	CF 8.2K OHM +-5% 1/16W
RUK2	0150136	VR 5K OHM-B
RUK3	0700048	CF 3.9K OHM +-5% 1/16W
RUK4	0700049	CF 4.7K OHM +-5% 1/16W
RUK5	0700053	CF 8.2K OHM +-5% 1/16W
RUK6	0150136	VR 5K OHM-B
RUK7	0700067	CF 100K OHM +-5% 1/16W
RUK8	0700048	CF 3.9K OHM +-5% 1/16W
RUK9	0700054	CF 10K OHM +-5% 1/16W
RUL1	0150136	VR 5K OHM-B
RUL2	0700054	CF 10K OHM +-5% 1/16W
RUL3	0700043	CF 1.5K OHM +-5% 1/16W
RUL4	0700047	CF 3.3K OHM +-5% 1/16W
RUL5	0150136	VR 5K OHM-B
RUL6	0700054	CF 10K OHM +-5% 1/16W
RUL7	0700047	CF 3.3K OHM +-5% 1/16W
RUL8	0700047	CF 3.3K OHM +-5% 1/16W
RUL9	0150137	VR 10K OHM-B
RUN1	0700047	CF 3.3K OHM +-5% 1/16W
RUN2	0700047	CF 3.3K OHM +-5% 1/16W
RUN3	0150633	VR 30K OHM
RUN4	0700064	CF 56K OHM +-5% 1/16W
RUN5	0150138	VR 20K OHM-B
RUN6	0700062	CF 39K OHM +-5% 1/16W
RUN7	0700064	CF 56K OHM +-5% 1/16W
RUN8	0700063	CF 47K OHM +-5% 1/16W
RUN9	0150138	VR 20K OHM-B
RUP1	0700058	CF 22K OHM +-5% 1/16W
RUP2	0700063	CF 47K OHM +-5% 1/16W
RUP3	0700064	CF 56K OHM +-5% 1/16W
RUP4	0150138	VR 20K OHM-B

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RUP5	0700062	CF 39K OHM +-5% 1/16W
RUP6	0700064	CF 56K OHM +-5% 1/16W
RUP7	0700063	CF 47K OHM +-5% 1/16W
RUP8	0150138	VR 20K OHM-B
RUP9	0700058	CF 22K OHM +-5% 1/16W
RUQ1	0700063	CF 47K OHM +-5% 1/16W
RUQ2	0700064	CF 56K OHM +-5% 1/16W
RUQ3	0150138	VR 20K OHM-B
RUQ4	0700062	CF 39K OHM +-5% 1/16W
RUQ5	0700064	CF 56K OHM +-5% 1/16W
RUQ6	0700063	CF 47K OHM +-5% 1/16W
RUQ7	0150138	VR 20K OHM-B
RUQ8	0700058	CF 22K OHM +-5% 1/16W
RUQ9	0700063	CF 47K OHM +-5% 1/16W
RU01	0150136	VR 5K OHM-B
RU02	0700042	CF 1.2K OHM +-5% 1/16W
RU03	0700049	CF 4.7K OHM +-5% 1/16W
RU04	0700051	CF 5.6K OHM +-5% 1/16W
RU05	0150136	VR 5K OHM-B
RU06	0700042	CF 1.2K OHM +-5% 1/16W
RU07	0700046	CF 2.7K OHM +-5% 1/16W
RU08	0700052	CF 6.8K OHM +-5% 1/16W
RU09	0150136	VR 5K OHM-B
RU10	0700048	CF 3.9K OHM +-5% 1/16W
RU11	0700043	CF 1.5K OHM +-5% 1/16W
RU12	0700045	CF 2.2K OHM +-5% 1/16W
RU13	0150136	VR 5K OHM-B
RU14	0700047	CF 3.3K OHM +-5% 1/16W
RU15	0700054	CF 10K OHM +-5% 1/16W
RU16	0700047	CF 3.3K OHM +-5% 1/16W
RU17	0150136	VR 5K OHM-B
RU18	0700054	CF 10K OHM +-5% 1/16W
RU19	0150136	VR 5K OHM-B
RU20	0700047	CF 3.3K OHM +-5% 1/16W
RU21	0700048	CF 3.9K OHM +-5% 1/16W
RU22	0700049	CF 4.7K OHM +-5% 1/16W
RU23	0150136	VR 5K OHM-B
RU24	0700058	CF 22K OHM +-5% 1/16W
RU25	0150136	VR 5K OHM-B
RU26	0700046	CF 2.7K OHM +-5% 1/16W
RU27	0700053	CF 8.2K OHM +-5% 1/16W
RU28	0700054	CF 10K OHM +-5% 1/16W
RU29	0150136	VR 5K OHM-B
RU30	0700042	CF 1.2K OHM +-5% 1/16W
RU31	0700049	CF 4.7K OHM +-5% 1/16W
RU32	0700052	CF 6.8K OHM +-5% 1/16W
RU33	0150136	VR 5K OHM-B
RU34	0700042	CF 1.2K OHM +-5% 1/16W
RU35	0700042	CF 1.2K OHM +-5% 1/16W
RU36	0700052	CF 6.8K OHM +-5% 1/16W
RU37	0150136	VR 5K OHM-B
RU38	0700045	CF 2.2K OHM +-5% 1/16W
RU39	0700048	CF 3.9K OHM +-5% 1/16W
RU40	0700047	CF 3.3K OHM +-5% 1/16W
RU41	0150136	VR 5K OHM-B
RU42	0700051	CF 5.6K OHM +-5% 1/16W
RU43	0700041	CF 1K OHM +-5% 1/16W
RU44	0700052	CF 6.8K OHM +-5% 1/16W
RU45	0150136	VR 5K OHM-B
RU46	0700053	CF 8.2K OHM +-5% 1/16W
RU47	0150136	VR 5K OHM-B
RU48	0700047	CF 3.3K OHM +-5% 1/16W
RU49	0700047	CF 3.3K OHM +-5% 1/16W
RU50	0700049	CF 4.7K OHM +-5% 1/16W
RU51	0150136	VR 5K OHM-B
RU52	0700056	CF 15K OHM +-5% 1/16W
RU53	0150136	VR 5K OHM-B
RU54	0700046	CF 2.7K OHM +-5% 1/16W
RU55	0700052	CF 6.8K OHM +-5% 1/16W
RU56	0700054	CF 10K OHM +-5% 1/16W
RU57	0150136	VR 5K OHM-B
RU58	0700048	CF 3.9K OHM +-5% 1/16W
RU59	0700053	CF 8.2K OHM +-5% 1/16W
RU60	0700045	CF 2.2K OHM +-5% 1/16W
RU61	0150136	VR 5K OHM-B
RU62	0700043	CF 1.5K OHM +-5% 1/16W
RU63	0700056	CF 15K OHM +-5% 1/16W
RU64	0700041	CF 1K OHM +-5% 1/16W
RU65	0150136	VR 5K OHM-B
RU66	0700054	CF 10K OHM +-5% 1/16W
RU67	0700044	CF 1.8K OHM +-5% 1/16W
RU68	0700041	CF 1K OHM +-5% 1/16W
RU69	0150136	VR 5K OHM-B
RU70	0700054	CF 10K OHM +-5% 1/16W
RU71	0700041	CF 1K OHM +-5% 1/16W
RU72	0700045	CF 2.2K OHM +-5% 1/16W
RU73	0150136	VR 5K OHM-B
RU74	0700061	CF 33K OHM +-5% 1/16W
RU75	0700041	CF 1K OHM +-5% 1/16W
RU76	0150136	VR 5K OHM-B
RU77	0700047	CF 3.3K OHM +-5% 1/16W
RU78	0700046	CF 2.7K OHM +-5% 1/16W
RU79	0700046	CF 2.7K OHM +-5% 1/16W
RU80	0150136	VR 5K OHM-B
RU81	0700066	CF 82K OHM +-5% 1/16W
RU82	0150136	VR 5K OHM-B
RU83	0700048	CF 3.9K OHM +-5% 1/16W
RU84	0700053	CF 8.2K OHM +-5% 1/16W
RU85	0700054	CF 10K OHM +-5% 1/16W
RU86	0150136	VR 5K OHM-B
RU87	0700048	CF 3.9K OHM +-5% 1/16W
RU88	0700051	CF 5.6K OHM +-5% 1/16W
RU89	0700048	CF 3.9K OHM +-5% 1/16W
RU90	0150136	VR 5K OHM-B
RU91	0700042	CF 1.2K OHM +-5% 1/16W
RU92	0700041	CF 1K OHM +-5% 1/16W
RU93	0700054	CF 10K OHM +-5% 1/16W
RU94	0150136	VR 5K OHM-B
RU95	0700054	CF 10K OHM +-5% 1/16W
RU96	0700043	CF 1.5K OHM +-5% 1/16W
RU97	0700048	CF 3.9K OHM +-5% 1/16W
RU98	0150136	VR 5K OHM-B
RU99	0700052	CF 6.8K OHM +-5% 1/16W
RW13	0700041	CF 1K OHM +-5% 1/16W
RW14	0700065	CF 68K OHM +-5% 1/16W
RW15	0187076	CF 3K OHM +-5% 1/16W
RW16	0187082	CF 5.1K OHM +-5% 1/16W
RW17	0700056	CF 15K OHM +-5% 1/16W
RW70	0187070M	CF 1.6K OHM +-5% 1/16W
RW85	0700041	CF 1K OHM +-5% 1/16W
RW86	0700041	CF 1K OHM +-5% 1/16W
RY01	0700027	CF 100 OHM +-5% 1/16W
RY05	0700027	CF 100 OHM +-5% 1/16W
RY06	0700027	CF 100 OHM +-5% 1/16W
RY07	0700027	CF 100 OHM +-5% 1/16W
RY08	0700041	CF 1K OHM +-5% 1/16W
RY09	0700041	CF 1K OHM +-5% 1/16W
RY10	0700041	CF 1K OHM +-5% 1/16W
RY11	0700041	CF 1K OHM +-5% 1/16W
RY12	0700027	CF 100 OHM +-5% 1/16W
RY13	0700027	CF 100 OHM +-5% 1/16W
RY14	0700027	CF 100 OHM +-5% 1/16W
RY15	0700027	CF 100 OHM +-5% 1/16W
RY17	0700041	CF 1K OHM +-5% 1/16W
RY19	0700041	CF 1K OHM +-5% 1/16W
RY31	0100038	CF 75 OHM +-5% 1/8W
RY32	0100038	CF 75 OHM +-5% 1/8W
RY33	0700063	CF 47K OHM +-5% 1/16W
RY34	0700058	CF 22K OHM +-5% 1/16W
RY35	0100038	CF 75 OHM +-5% 1/8W
RY39	0700034	CF 330 OHM +-5% 1/16W
RY40	0114141	CF 270 OHM +-5% 1/4W
RY41	0100037	CF 68 OHM +-5% 1/8W
RY42	0100113	CF 100K OHM +-5% 1/8W
RY43	0700041	CF 1K OHM +-5% 1/16W
RY44	0700054	CF 10K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RY45	0700039	CF 820 OHM +-5% 1/16W
RY47	0700054	CF 10K OHM +-5% 1/16W
R004	0100065	CF 1K OHM +-5% 1/8W
R005	0100089	CF 10K OHM +-5% 1/8W
R006	0100065	CF 1K OHM +-5% 1/8W
R007	0100065	CF 1K OHM +-5% 1/8W
R008	0700041	CF 1K OHM +-5% 1/16W
R009	0700041	CF 1K OHM +-5% 1/16W
R010	0700054	CF 10K OHM +-5% 1/16W
R011	0700041	CF 1K OHM +-5% 1/16W
R012	0700041	CF 1K OHM +-5% 1/16W
R013	0700058	CF 22K OHM +-5% 1/16W
R014	0700058	CF 22K OHM +-5% 1/16W
R015	0700058	CF 22K OHM +-5% 1/16W
R016	0700041	CF 1K OHM +-5% 1/16W
R017	0700041	CF 1K OHM +-5% 1/16W
R018	0700041	CF 1K OHM +-5% 1/16W
R019	0700032	CF 220 OHM +-5% 1/16W
R020	0700041	CF 1K OHM +-5% 1/16W
R021	0700041	CF 1K OHM +-5% 1/16W
R022	0700058	CF 22K OHM +-5% 1/16W
R023	0700049	CF 4.7K OHM +-5% 1/16W
R025	0700041	CF 1K OHM +-5% 1/16W
R026	0700041	CF 1K OHM +-5% 1/16W
R028	0700041	CF 1K OHM +-5% 1/16W
R029	0700041	CF 1K OHM +-5% 1/16W
R032	0700041	CF 1K OHM +-5% 1/16W
R033	0700054	CF 10K OHM +-5% 1/16W
R035	0700058	CF 22K OHM +-5% 1/16W
R037	0700041	CF 1K OHM +-5% 1/16W
R038	0700041	CF 1K OHM +-5% 1/16W
R040	0700027	CF 100 OHM +-5% 1/16W
R042	0700054	CF 10K OHM +-5% 1/16W
R043	0700054	CF 10K OHM +-5% 1/16W
R044	0700049	CF 4.7K OHM +-5% 1/16W
R048	0700058	CF 22K OHM +-5% 1/16W
R049	0700058	CF 22K OHM +-5% 1/16W
R052	0700054	CF 10K OHM +-5% 1/16W
R053	0700041	CF 1K OHM +-5% 1/16W
R055	0700054	CF 10K OHM +-5% 1/16W
R059	0700054	CF 10K OHM +-5% 1/16W
R060	0700054	CF 10K OHM +-5% 1/16W
R061	0700054	CF 10K OHM +-5% 1/16W
R062	0700054	CF 10K OHM +-5% 1/16W
R063	0700055	CF 12K OHM +-5% 1/16W
R064	0700054	CF 10K OHM +-5% 1/16W
R065	0700045	CF 2.2K OHM +-5% 1/16W
R066	0700058	CF 22K OHM +-5% 1/16W
R067	0700049	CF 4.7K OHM +-5% 1/16W
R068	0700067	CF 100K OHM +-5% 1/16W
R069	0700031	CF 180 OHM +-5% 1/16W
R070	0700066	CF 82K OHM +-5% 1/16W
R071	0700058	CF 22K OHM +-5% 1/16W
R073	0700041	CF 1K OHM +-5% 1/16W
R074	0700036	CF 470 OHM +-5% 1/16W
R075	0700036	CF 470 OHM +-5% 1/16W
R078	0700054	CF 10K OHM +-5% 1/16W
R079	0700054	CF 10K OHM +-5% 1/16W
R080	0100107	CF 56K OHM +-5% 1/8W
R081	0700051	CF 5.6K OHM +-5% 1/16W
R082	0700051	CF 5.6K OHM +-5% 1/16W
R083	0700036	CF 470 OHM +-5% 1/16W
R084	0700036	CF 470 OHM +-5% 1/16W
R085	0700041	CF 1K OHM +-5% 1/16W
R086	0700041	CF 1K OHM +-5% 1/16W
R087	0700027	CF 100 OHM +-5% 1/16W
R090	0700041	CF 1K OHM +-5% 1/16W
R091	0700049	CF 4.7K OHM +-5% 1/16W
R092	0700041	CF 1K OHM +-5% 1/16W
R093	0700041	CF 1K OHM +-5% 1/16W
R094	0700041	CF 1K OHM +-5% 1/16W
R095	0700056	CF 15K OHM +-5% 1/16W
R096	0700054	CF 10K OHM +-5% 1/16W
R097	0700063	CF 47K OHM +-5% 1/16W
R099	0700063	CF 47K OHM +-5% 1/16W
R100	0700067	CF 100K OHM +-5% 1/16W
R101	0700058	CF 22K OHM +-5% 1/16W
R102	0700058	CF 22K OHM +-5% 1/16W
R103	0700041	CF 1K OHM +-5% 1/16W
R104	0700041	CF 1K OHM +-5% 1/16W
R105	0700041	CF 1K OHM +-5% 1/16W
R106	0700058	CF 22K OHM +-5% 1/16W
R107	0700041	CF 1K OHM +-5% 1/16W
R108	0700051	CF 5.6K OHM +-5% 1/16W
R109	0700041	CF 1K OHM +-5% 1/16W
R110	0700041	CF 1K OHM +-5% 1/16W
R113	0700056	CF 15K OHM +-5% 1/16W
R116	0700054	CF 10K OHM +-5% 1/16W
R117	0700054	CF 10K OHM +-5% 1/16W
R119	0700041	CF 1K OHM +-5% 1/16W
R130	0700058	CF 22K OHM +-5% 1/16W
R131	0700055	CF 12K OHM +-5% 1/16W
R132	0700063	CF 47K OHM +-5% 1/16W
R133	0700054	CF 10K OHM +-5% 1/16W
R134	0700058	CF 22K OHM +-5% 1/16W
R135	0700041	CF 1K OHM +-5% 1/16W
R136	0700041	CF 1K OHM +-5% 1/16W
R137	0700041	CF 1K OHM +-5% 1/16W
R138	0700041	CF 1K OHM +-5% 1/16W
R139	0700041	CF 1K OHM +-5% 1/16W
R140	0700041	CF 1K OHM +-5% 1/16W
R141	0700041	CF 1K OHM +-5% 1/16W
R142	0700041	CF 1K OHM +-5% 1/16W
R143	0700041	CF 1K OHM +-5% 1/16W
R144	0700041	CF 1K OHM +-5% 1/16W
R145	0700027	CF 100 OHM +-5% 1/16W
R146	0700054	CF 10K OHM +-5% 1/16W
R147	0700041	CF 1K OHM +-5% 1/16W
R148	0700041	CF 1K OHM +-5% 1/16W
R149	0700041	CF 1K OHM +-5% 1/16W
R150	0700041	CF 1K OHM +-5% 1/16W
R151	0100059	CF 560 OHM +-5% 1/8W
R152	0700022	CF 39 OHM +-5% 1/16W
R153	0100065	CF 1K OHM +-5% 1/8W
R157	0700034	CF 330 OHM +-5% 1/16W
R158	0700041	CF 1K OHM +-5% 1/16W
R159	0700051	CF 5.6K OHM +-5% 1/16W
R161	0700041	CF 1K OHM +-5% 1/16W
R166	0700054	CF 10K OHM +-5% 1/16W
R167	0700054	CF 10K OHM +-5% 1/16W
R168	0700054	CF 10K OHM +-5% 1/16W
R169	0700037	CF 560 OHM +-5% 1/16W
R170	0700027	CF 100 OHM +-5% 1/16W
R171	0700029	CF 150 OHM +-5% 1/16W
R175	0700058	CF 22K OHM +-5% 1/16W
R176	0700058	CF 22K OHM +-5% 1/16W
R177	0700027	CF 100 OHM +-5% 1/16W
R178	0700063	CF 47K OHM +-5% 1/16W
R180	0700027	CF 100 OHM +-5% 1/16W
R181	0700027	CF 100 OHM +-5% 1/16W
R185	0700054	CF 10K OHM +-5% 1/16W
R186	0700041	CF 1K OHM +-5% 1/16W
R188	0700054	CF 10K OHM +-5% 1/16W
R189	0700063	CF 47K OHM +-5% 1/16W
R190	0700051	CF 5.6K OHM +-5% 1/16W
R192	0100041	CF 100 OHM +-5% 1/8W
R193	0700027	CF 100 OHM +-5% 1/16W
R195	0700054	CF 10K OHM +-5% 1/16W
R3A5	0700041	CF 1K OHM +-5% 1/16W
R3A6	0700041	CF 1K OHM +-5% 1/16W
R3A7	0700041	CF 1K OHM +-5% 1/16W
R3A8	0100119	CF 180K OHM +-5% 1/8W
R3A9	0700042	CF 1.2K OHM +-5% 1/16W
R3B1	0700027	CF 100 OHM +-5% 1/16W
R3B2	0700032	CF 220 OHM +-5% 1/16W
R3B3	0700055	CF 12K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R3B5	0700054	CF 10K OHM +-5% 1/16W	R384	0700039	CF 820 OHM +-5% 1/16W
R3B6	0700063	CF 47K OHM +-5% 1/16W	R385	0700043	CF 1.5K OHM +-5% 1/16W
R3B7	0700063	CF 47K OHM +-5% 1/16W	R386	0114135	CF 150 OHM +-5% 1/4W
R301	0700041	CF 1K OHM +-5% 1/16W	R387	0700037	CF 560 OHM +-5% 1/16W
R302	0700041	CF 1K OHM +-5% 1/16W	R388	0700027	CF 100 OHM +-5% 1/16W
R303	0700041	CF 1K OHM +-5% 1/16W	R389	0700063	CF 47K OHM +-5% 1/16W
R304	0700029	CF 150 OHM +-5% 1/16W	R390	0100055	CF 390 OHM +-5% 1/8W
R305	0700054	CF 10K OHM +-5% 1/16W	R391	0100115	CF 120K OHM +-5% 1/8W
R306	0700058	CF 22K OHM +-5% 1/16W	R392	0700041	CF 1K OHM +-5% 1/16W
R307	0700058	CF 22K OHM +-5% 1/16W	R393	0700052	CF 6.8K OHM +-5% 1/16W
R308	0700046	CF 2.7K OHM +-5% 1/16W	R394	0700046	CF 2.7K OHM +-5% 1/16W
R309	0700054	CF 10K OHM +-5% 1/16W	R395	0700043	CF 1.5K OHM +-5% 1/16W
R310	0700065	CF 68K OHM +-5% 1/16W	R396	0700061	CF 33K OHM +-5% 1/16W
R311	0700061	CF 33K OHM +-5% 1/16W	R397	0700057	CF 18K OHM +-5% 1/16W
R312	0700029	CF 150 OHM +-5% 1/16W	R398	0100121	CF 220K OHM +-5% 1/8W
R313	0700049	CF 4.7K OHM +-5% 1/16W	R425	0700054	CF 10K OHM +-5% 1/16W
R314	0700046	CF 2.7K OHM +-5% 1/16W	R426	0700054	CF 10K OHM +-5% 1/16W
R315	0700033	CF 270 OHM +-5% 1/16W	R453	0700041	CF 1K OHM +-5% 1/16W
R316	0700041	CF 1K OHM +-5% 1/16W	R454	0700041	CF 1K OHM +-5% 1/16W
R317	0700061	CF 33K OHM +-5% 1/16W	R466	0700041	CF 1K OHM +-5% 1/16W
R318	0700042	CF 1.2K OHM +-5% 1/16W	R467	0700041	CF 1K OHM +-5% 1/16W
R319	0700064	CF 56K OHM +-5% 1/16W	R471	0700054	CF 10K OHM +-5% 1/16W
R320	0700065	CF 68K OHM +-5% 1/16W	R472	0700054	CF 10K OHM +-5% 1/16W
R321	0700064	CF 56K OHM +-5% 1/16W	R473	0700051	CF 5.6K OHM +-5% 1/16W
R322	0700058	CF 22K OHM +-5% 1/16W	R474	0700051	CF 5.6K OHM +-5% 1/16W
R323	0700054	CF 10K OHM +-5% 1/16W	R475	0700045	CF 2.2K OHM +-5% 1/16W
R324	0700058	CF 22K OHM +-5% 1/16W	R476	0700045	CF 2.2K OHM +-5% 1/16W
R325	0150114	VR 10K OHM-B	R477	0700063	CF 47K OHM +-5% 1/16W
R326	0700062	CF 39K OHM +-5% 1/16W	R478	0700067	CF 100K OHM +-5% 1/16W
R327	0700059	CF 27K OHM +-5% 1/16W	R479	0700036	CF 470 OHM +-5% 1/16W
R328	0700046	CF 2.7K OHM +-5% 1/16W	R480	1195051	FR 2.2 OHM +-5% 1/4W
R329	0700047	CF 3.3K OHM +-5% 1/16W	R481	1195051	FR 2.2 OHM +-5% 1/4W
R330	0700029	CF 150 OHM +-5% 1/16W	R482	0700063	CF 47K OHM +-5% 1/16W
R331	0700049	CF 4.7K OHM +-5% 1/16W	R483	0700041	CF 1K OHM +-5% 1/16W
R332	0700049	CF 4.7K OHM +-5% 1/16W	R484	0700058	CF 22K OHM +-5% 1/16W
R333	0150115	VR 20K OHM-B	R485	0700065	CF 68K OHM +-5% 1/16W
R334	0700051	CF 5.6K OHM +-5% 1/16W	R486	0700065	CF 68K OHM +-5% 1/16W
R335	0700049	CF 4.7K OHM +-5% 1/16W	R487	0114161	CF 1K OHM +-5% 1/4W
R336	0100133	CF 680K OHM +-5% 1/8W	R488	0114161	CF 1K OHM +-5% 1/4W
R337	0700058	CF 22K OHM +-5% 1/16W	R501	0187086	CF 7.5K OHM +-5% 1/16W
R338	0700054	CF 10K OHM +-5% 1/16W	R502	0150110	VR 500 OHM-B
R339	0700066	CF 82K OHM +-5% 1/16W	R503	0700036	CF 470 OHM +-5% 1/16W
R340	0700054	CF 10K OHM +-5% 1/16W	R505	0150110	VR 500 OHM-B
R341	0700067	CF 100K OHM +-5% 1/16W	R506	0150111	VR 1K OHM-B
R342	0700052	CF 6.8K OHM +-5% 1/16W	R507	0700067	CF 100K OHM +-5% 1/16W
R344	0700049	CF 4.7K OHM +-5% 1/16W	R508	0700036	CF 470 OHM +-5% 1/16W
R346	0700067	CF 100K OHM +-5% 1/16W	R509	0700041	CF 1K OHM +-5% 1/16W
R347	0700046	CF 2.7K OHM +-5% 1/16W	R510	0179536	MG 1M OHM +-5% 1/8W
R348	0700049	CF 4.7K OHM +-5% 1/16W	R513	0700041	CF 1K OHM +-5% 1/16W
R351	0700048	CF 3.9K OHM +-5% 1/16W	R514	0100129	CF 470K OHM +-5% 1/8W
R352	0700047	CF 3.3K OHM +-5% 1/16W	R516	0700066	CF 82K OHM +-5% 1/16W
R353	0700041	CF 1K OHM +-5% 1/16W	R517	0700054	CF 10K OHM +-5% 1/16W
R355	0700048	CF 3.9K OHM +-5% 1/16W	R518	0700067	CF 100K OHM +-5% 1/16W
R356	0700051	CF 5.6K OHM +-5% 1/16W	R519	0700061	CF 33K OHM +-5% 1/16W
R357	0700054	CF 10K OHM +-5% 1/16W	R520	0700067	CF 100K OHM +-5% 1/16W
R358	0179536	MG 1M OHM +-5% 1/8W	R521	0700054	CF 10K OHM +-5% 1/16W
R359	0700034	CF 330 OHM +-5% 1/16W	R522	0700065	CF 68K OHM +-5% 1/16W
R361	0700034	CF 330 OHM +-5% 1/16W	R523	0700054	CF 10K OHM +-5% 1/16W
R362	0700034	CF 330 OHM +-5% 1/16W	R526	0700054	CF 10K OHM +-5% 1/16W
R363	0700027	CF 100 OHM +-5% 1/16W	R527	0700054	CF 10K OHM +-5% 1/16W
R364	0700054	CF 10K OHM +-5% 1/16W	R528	0700067	CF 100K OHM +-5% 1/16W
R365	0700039	CF 820 OHM +-5% 1/16W	R529	0700059	CF 27K OHM +-5% 1/16W
R366	0700041	CF 1K OHM +-5% 1/16W	R530	0700047	CF 3.3K OHM +-5% 1/16W
R367	0150113	VR 5K OHM-B RS-6	R531	0700049	CF 4.7K OHM +-5% 1/16W
R368	0700051	CF 5.6K OHM +-5% 1/16W	R532	0700061	CF 33K OHM +-5% 1/16W
R369	0700033	CF 270 OHM +-5% 1/16W	R533	0700046	CF 2.7K OHM +-5% 1/16W
R371	0700041	CF 1K OHM +-5% 1/16W	R534	0700054	CF 10K OHM +-5% 1/16W
R374	0700047	CF 3.3K OHM +-5% 1/16W	R535	0700054	CF 10K OHM +-5% 1/16W
R375	0100125	CF 330K OHM +-5% 1/8W	R538	0100037	CF 68 OHM +-5% 1/8W
R376	0700041	CF 1K OHM +-5% 1/16W	R539	0100049	CF 220 OHM +-5% 1/8W
R381	0100051	CF 270 OHM +-5% 1/8W	R540	0100049	CF 220 OHM +-5% 1/8W
R382	0700062	CF 39K OHM +-5% 1/16W	R541	0100049	CF 220 OHM +-5% 1/8W
R383	0700038	CF 680 OHM +-5% 1/16W	R543	0700027	CF 100 OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R544	0700054	CF 10K OHM +-5% 1/16W	R728	0700045	CF 2.2K OHM +-5% 1/16W
R545	0700054	CF 10K OHM +-5% 1/16W	R729	0700047	CF 3.3K OHM +-5% 1/16W
R548	0700054	CF 10K OHM +-5% 1/16W	R730	0113729	CF 150 OHM +-5% 1/2W
R549	0700029	CF 150 OHM +-5% 1/16W	R731	0110101	MF 15 OHM +-5% 1W
R550	0700066	CF 82K OHM +-5% 1/16W	R734	0110145	MF 1K OHM +-5% 1W
R609	0100065	CF 1K OHM +-5% 1/8W	R735	0110129	MF 220 OHM +-5% 1W
R610	0700061	CF 33K OHM +-5% 1/16W	R736	0110151	MF 1.8K OHM +-5% 1W
R611	0700064	CF 56K OHM +-5% 1/16W	⚠R741	0700046	CF 2.7K OHM +-5% 1/16W
R613	0700065	CF 68K OHM +-5% 1/16W	R742	0100087	CF 8.2K OHM +-5% 1/8W
R614	0700061	CF 33K OHM +-5% 1/16W	R743	0700051	CF 5.6K OHM +-5% 1/16W
R615	0700038	CF 680 OHM +-5% 1/16W	R744	0700052	CF 6.8K OHM +-5% 1/16W
R616	0700064	CF 56K OHM +-5% 1/16W	R745	0700056	CF 15K OHM +-5% 1/16W
R617	0119722	MF 1 OHM +-5% 1W	R746	0114139	CF 220 OHM +-5% 1/4W
R618	0119722	MF 1 OHM +-5% 1W	R801	0140326S	MF 5.6K OHM +-5% 5W
R619	0700027	CF 100 OHM +-5% 1/16W	R803	0113744	CF 560 OHM +-5% 1/2W
R620	0700054	CF 10K OHM +-5% 1/16W	R806	0113815	CF 470K OHM +-5% 1/2W
R621	0700051	CF 5.6K OHM +-5% 1/16W	R809	0100065	CF 1K OHM +-5% 1/8W
R622	0700065	CF 68K OHM +-5% 1/16W	R810	0100035	CF 56 OHM +-5% 1/8W
R623	0113766	CF 4.7K OHM +-5% 1/2W	R811	0100065	CF 1K OHM +-5% 1/8W
R624	0110121	MF 100 OHM +-5% 1W	R812	0100044	CF 130 OHM +-5% 1/8W
R625	0113725	CF 100 OHM +-5% 1/2W	R815	0100059	CF 560 OHM +-5% 1/8W
R626	0113725	CF 100 OHM +-5% 1/2W	R817	0100041	CF 100 OHM +-5% 1/8W
R627	0113725	CF 100 OHM +-5% 1/2W	R818	0100049	CF 220 OHM +-5% 1/8W
R635	0100053	CF 330 OHM +-5% 1/8W	R831	0140326S	MF 5.6K OHM +-5% 5W
R636	0100063	CF 820 OHM +-5% 1/8W	R833	0113744	CF 560 OHM +-5% 1/2W
R637	0700044	CF 1.8K OHM +-5% 1/16W	R836	0113815	CF 470K OHM +-5% 1/2W
R638	0700058	CF 22K OHM +-5% 1/16W	R840	0100035	CF 56 OHM +-5% 1/8W
R639	0700041	CF 1K OHM +-5% 1/16W	R841	0100065	CF 1K OHM +-5% 1/8W
R640	0700041	CF 1K OHM +-5% 1/16W	R842	0100033	CF 47 OHM +-5% 1/8W
R642	0700061	CF 33K OHM +-5% 1/16W	⚠R843	0150001	VR 200 OHM-B
R643	0700056	CF 15K OHM +-5% 1/16W	R845	0100059	CF 560 OHM +-5% 1/8W
R646	0700045	CF 2.2K OHM +-5% 1/16W	R847	0100041	CF 100 OHM +-5% 1/8W
R647	0700054	CF 10K OHM +-5% 1/16W	R861	0140326S	MF 5.6K OHM +-5% 5W
R652	0700063	CF 47K OHM +-5% 1/16W	R863	0113744	CF 560 OHM +-5% 1/2W
R653	0700041	CF 1K OHM +-5% 1/16W	R866	0113815	CF 470K OHM +-5% 1/2W
R654	0700047	CF 3.3K OHM +-5% 1/16W	R870	0100035	CF 56 OHM +-5% 1/8W
R655	0700067	CF 100K OHM +-5% 1/16W	R871	0100065	CF 1K OHM +-5% 1/8W
R656	0700045	CF 2.2K OHM +-5% 1/16W	R872	0100033	CF 47 OHM +-5% 1/8W
R658	0114135	CF 150 OHM +-5% 1/4W	⚠R873	0150001	VR 200 OHM-B
R659	0100045	CF 150 OHM +-5% 1/8W	R875	0100059	CF 560 OHM +-5% 1/8W
R660	0119731	FR 0.68 OHM 1W	R877	0100049	CF 220 OHM +-5% 1/8W
R661	0700054	CF 10K OHM +-5% 1/16W	R903	0147060	WW 33 OHM +-5% 2W
R662	0700041	CF 1K OHM +-5% 1/16W	⚠R904	0147804	WW 0.75 OHM 15W
R663	0700059	CF 27K OHM +-5% 1/16W	R905	0148009	WW 0.056 OHM 2W
R664	0700041	CF 1K OHM +-5% 1/16W	R906	0700037	CF 560 OHM +-5% 1/16W
R665	0700054	CF 10K OHM +-5% 1/16W	R907	0700046	CF 2.7K OHM +-5% 1/16W
R666	0700059	CF 27K OHM +-5% 1/16W	R908	0700054	CF 10K OHM +-5% 1/16W
R667	0119732	MF 1.2 OHM +-10% 1W	R909	0700047	CF 3.3K OHM +-5% 1/16W
R701	0700039	CF 820 OHM +-5% 1/16W	R911	0700049	CF 4.7K OHM +-5% 1/16W
R702	0700041	CF 1K OHM +-5% 1/16W	R912	0700049	CF 4.7K OHM +-5% 1/16W
R703	0113770	CF 6.8K OHM +-5% 1/2W	R913	0110169	MF 10K OHM +-5% 1W
R704	0110355	MF 2.7K OHM +-5% 3W	R914	0700023	CF 47 OHM +-5% 1/16W
R705	0110351	MF 1.8K OHM +-5% 3W	R915	0700027	CF 100 OHM +-5% 1/16W
⚠R706	0119688	MF 0.22 OHM +-5% 1W	R916	0700036	CF 470 OHM +-5% 1/16W
R707	0100031	CF 39 OHM +-5% 1/8W	R917	0700061	CF 33K OHM +-5% 1/16W
R708	0113791	CF 47K OHM +-5% 1/2W	R918	0114161	CF 1K OHM +-5% 1/4W
R709	0113785	CF 27K OHM +-5% 1/2W	R920	0110237	MF 470 OHM +-5% 2W
R710	0110229	MF 220 OHM +-5% 2W	R921	0700057	CF 18K OHM +-5% 1/16W
⚠R711	1195121	FR 1 OHM +-5% 1/4W	R922	0700057	CF 18K OHM +-5% 1/16W
⚠R712	0119514	FR 10 OHM +-5% 1/4W	R923	0700047	CF 3.3K OHM +-5% 1/16W
R713	0113717	CF 47 OHM +-5% 1/2W	R924	0700047	CF 3.3K OHM +-5% 1/16W
⚠R714	0700063	CF 47K OHM +-5% 1/16W	R932	0110145	MF 1K OHM +-5% 1W
R715	0100085	CF 6.8K OHM +-5% 1/8W	⚠R934	0119839	MF 0.56 OHM +-5% 1W
R716	0700042	CF 1.2K OHM +-5% 1/16W	R935	0700054	CF 10K OHM +-5% 1/16W
R717	0114149	CF 560 OHM +-5% 1/4W	R936	0700058	CF 22K OHM +-5% 1/16W
R718	0100127	CF 390K OHM +-5% 1/8W	R937	0700063	CF 47K OHM +-5% 1/16W
R719	0700054	CF 10K OHM +-5% 1/16W	⚠R938	0113797	CF 82K OHM +-5% 1/2W
R721	0110365	MF 6.8K OHM +-5% 3W	⚠R939	0700051	CF 5.6K OHM +-5% 1/16W
R723	0110215	MF 56 OHM +-5% 2W	R940	0700054	CF 10K OHM +-5% 1/16W
R724	0114177	CF 4.7K OHM +-5% 1/4W	R941	0700054	CF 10K OHM +-5% 1/16W
R725	0700052	CF 6.8K OHM +-5% 1/16W	R942	0700058	CF 22K OHM +-5% 1/16W
R726	0700048	CF 3.9K OHM +-5% 1/16W	R943	0700036	CF 470 OHM +-5% 1/16W
R727	0700049	CF 4.7K OHM +-5% 1/16W	R944	0700041	CF 1K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
⚠ R945	0700039	CF 820 OHM +-5% 1/16W
⚠ R946	0700043	CF 1.5K OHM +-5% 1/16W
R947	0700041	CF 1K OHM +-5% 1/16W
R948	0700045	CF 2.2K OHM +-5% 1/16W
R949	0700038	CF 680 OHM +-5% 1/16W
R950	0700039	CF 820 OHM +-5% 1/16W
R951	0700049	CF 4.7K OHM +-5% 1/16W
R952	0700043	CF 1.5K OHM +-5% 1/16W
R953	0700051	CF 5.6K OHM +-5% 1/16W
R954	0700051	CF 5.6K OHM +-5% 1/16W
R956	0700045	CF 2.2K OHM +-5% 1/16W
R958	0700067	CF 100K OHM +-5% 1/16W
R959	0700051	CF 5.6K OHM +-5% 1/16W
R972	0110145	MF 1K OHM +-5% 1W
R973	0700042	CF 1.2K OHM +-5% 1/16W
R978	0700052	CF 6.8K OHM +-5% 1/16W
R980	0700045	CF 2.2K OHM +-5% 1/16W
		IC'S
IK04	2003191	IC STK4274 (LINEAR)
IK05	2003191	IC STK4274 (LINEAR)
IK06	2003191	IC STK4274 (LINEAR)
IK07	2380391	IC UPD6326C
IT01	2383191	IC LA7990
IT02	2914051	IC NJM4560D
IT03	2914051	IC NJM4560D
IT04	2914051	IC NJM4560D
IT05	2914051	IC NJM4560D
IT06	CP01631R	IC PST9142-T (HHEA MD)
IW01	CP00811	IC UPC1852BCT (HHEA MD)
IY01	2020452	IC CXA1545AS
I001	CP01191	IC MN1874862HHM3 (HHEA MD)
I002	2366301	IC UPD4052BC
I003	CP00822	IC M6M80042P (HHEA MD)
I004	2000541	IC M51951BSL
I005	2381141	HD74HC32P
I401	2020001	IC TDA9860
I402	2004751	IC TA8200AH
I501	2020324	IC YAT016H
I503	2004665	IC PQ09RF21
I504	2003421	IC UPC7805AHF
I601	2003541	IC LA7838 (LINEAR)
⚠ I901	2373343	MODULE STR-M6511
⚠ I902	2000465	IC PS2501-1 (KD/LD) (PHOTO COUPLER)
⚠ I903	2000465	IC PS2501-1 (KD/LD) (PHOTO COUPLER)
⚠ I904	2381343	IC SE115N
I906	2003413	IC UPC7912HF
I907	2003424	IC UPC7812AHF (LINEAR)
		TRANSISTORS
QA01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA02	2320637	TR 2SA673C/D SI 80MHZ 400MW
QA03	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA04	2320637	TR 2SA673C/D SI 80MHZ 400MW
QA05	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA06	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC02	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC03	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC04	2326871	TR DTC124ES
QC05	2320591	TR 2SC458B/C SI 230MHZ 200MW
⚠ QF01	2314991	TR 2SC4630
QF02	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF03	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF04	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF05	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF06	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF07	2320663	TR 2SC1213AC SI 80MHZ 400MW
QF08	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF09	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF10	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF11	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QM01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QM02	2312992	TR PHOTO TRANSISTOR PRT-38PT3F(M)
QN01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN02	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN03	2320637	TR 2SA673C/D SI 80MHZ 400MW
QN04	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN05	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN06	2320637	TR 2SA673C/D SI 80MHZ 400MW
QT01	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT02	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT03	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT04	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT05	2320681	TR 2SA673A B/C SI 80MHZ 400MW
QT06	2320681	TR 2SA673A B/C SI 80MHZ 400MW
QT07	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT08	2320681	TR 2SA673A B/C SI 80MHZ 400MW
QT11	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT12	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT13	2320595	TR 2SC458(D) SI 230MHZ 200MW
QT14	2320595	TR 2SC458(D) SI 230MHZ 200MW
QY01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QY07	2326021	TR 2SC1741S
QY08	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q001	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q002	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q003	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q004	2320643	TR 2SC1213C SI 80MHZ 400MW
Q005	2320643	TR 2SC1213C SI 80MHZ 400MW
Q006	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q007	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q009	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q011	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q014	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q015	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q016	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q017	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q018	2320598	TR 2SC458B/C/D SI 230MHZ 200MW
Q019	2323521	TR 2SD789 B/C/D/E
Q021	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q023	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q024	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q301	2326871	TR DTC124ES
Q302	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q303	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q304	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q305	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q306	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q307	2326871	TR DTC124ES
Q308	2326871	TR DTC124ES
Q309	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q312	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q313	2326021	TR 2SC1741S
Q314	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q315	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q316	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q318	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q319	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q419	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q420	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q421	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q422	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q504	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q505	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q506	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q604	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q605	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q606	2312177	TR 2SD 2375 LD P (HHEA MD)
Q607	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q609	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q610	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q612	2320591	TR 2SC458B/C SI 230MHZ 200MW

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SYMBOL NO.	PART NO.	PART DESCRIPTION
Q701	2326216	TR 2SC3116 S/T
Q704	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q705	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q706	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q707	2320637	TR 2SA673C/D SI 80MHZ 400MW
⚠ Q777	2315274F	TR 2SC4589-05
Q801	2312372F	TR 2SC3942
Q802	2320663	TR 2SC1213AC SI 80MHZ 400MW
Q803	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q804	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q831	2312372F	TR 2SC3942
Q832	2320663	TR 2SC1213AC SI 80MHZ 400MW
Q833	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q861	2312372F	TR 2SC3942
Q862	2320663	TR 2SC1213AC SI 80MHZ 400MW
Q863	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q901	2320665	TR 2SC1213A(D)
Q902	2312171	TR 2SC3852
⚠ Q903	2323782	TR 03P2M
⚠ Q909	2321112	TR 2SA778A
Q912	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q913	2320591	TR 2SC458B/C SI 230MHZ 200MW
Q914	2320637	TR 2SA673C/D SI 80MHZ 400MW
Q915	2312177	TR 2SD 2375 LD P (HHEA MD)
		DIODES
DA01	2398611	DI 1SS254
DA02	2398611	DI 1SS254
DA03	2339812M	ZD HZS3A2
DA04	2339812M	ZD HZS3A2
DC01	2398611	DI 1SS254
DC02	2398611	DI 1SS254
DF01	2398611	DI 1SS254
DF02	2398611	DI 1SS254
DF03	2398611	DI 1SS254
DF04	2398611	DI 1SS254
DF05	2398611	DI 1SS254
DF06	2398611	DI 1SS254
DK04	CH00172M	DI DFM1SD2
DK05	CH00172M	DI DFM1SD2
DK06	2334324	ZD RD36EB3
DK07	2334324	ZD RD36EB3
DK08	2334324	ZD RD36EB3
DK09	2334324	ZD RD36EB3
DK10	2334324	ZD RD36EB3
DK11	2334324	ZD RD36EB3
DK12	2334324	ZD RD36EB3
DK13	2334324	ZD RD36EB3
DK14	2334324	ZD RD36EB3
DK15	2334324	ZD RD36EB3
DK16	2334324	ZD RD36EB3
DK17	2334324	ZD RD36EB3
DK18	2331797	ZD HZ5C1
DK32	2398611	DI 1SS254
DM01	2398611	DI 1SS254
DM02	2398611	DI 1SS254
DM03	2339691	LED SLH-56VC77F
DM04	2339889	ZD HZS12C3
DN01	2398611	DI 1SS254
DN02	2398611	DI 1SS254
DN03	2398611	DI 1SS254
DN04	2398611	DI 1SS254
DN05	2398611	DI 1SS254
DN06	2339825	ZD HZS4B2
DN07	2398611	DI 1SS254
DN08	CH00151M	DI DSM1SD2
DN09	2331849	ZD HZ-12(C3)
DN10	2398611	DI 1SS254
DT01	23383211	DI 1SS270
DT02	23383211	DI 1SS270
DT03	23383211	DI 1SS270
DT04	23383211	DI 1SS270
DT05	23383211	DI 1SS270
DT06	23383211	DI 1SS270
DT07	23383211	DI 1SS270
DT08	23383211	DI 1SS270
DT09	23383211	DI 1SS270
DT11	2334285	ZD RD24EB4
DT12	2334285	ZD RD24EB4
DT13	2334285	ZD RD24EB4
DT14	2334285	ZD RD24EB4
DT15	2334285	ZD RD24EB4
DT16	2334285	ZD RD24EB4
DT17	2334285	ZD RD24EB4
DT18	2334285	ZD RD24EB4
DT19	2334285	ZD RD24EB4
DT20	2334285	ZD RD24EB4
DT21	2334285	ZD RD24EB4
DT22	2334285	ZD RD24EB4
D002	2339889	ZD HZS12C3
D003	2339889	ZD HZS12C3
D004	2339889	ZD HZS12C3
D005	2339889	ZD HZS12C3
D006	2339889	ZD HZS12C3
D008	2398611	DI 1SS254
D009	2398611	DI 1SS254
D010	2398611	DI 1SS254
D011	2398611	DI 1SS254
D013	2398611	DI 1SS254
D014	2398611	DI 1SS254
D016	2398611	DI 1SS254
D022	2398611	DI 1SS254
D024	2398611	DI 1SS254
D025	2398611	DI 1SS254
D026	2398611	DI 1SS254
D027	2339839	ZD HZS5C3
D028	2398611	DI 1SS254
D031	2398611	DI 1SS254
D032	2398611	DI 1SS254
D033	2339849	ZD HZS6C3
D034	2335991	ZD HZT-33
D037	2398611	DI 1SS254
D038	2398611	DI 1SS254
D039	2398611	DI 1SS254
D040	2398611	DI 1SS254
D041	2398611	DI 1SS254
D301	2398611	DI 1SS254
D302	2339855	ZD HZS7B2
D303	2398611	DI 1SS254
D304	2398611	DI 1SS254
D305	2398611	DI 1SS254
D306	2398611	DI 1SS254
D307	2398611	DI 1SS254
D308	2398611	DI 1SS254
D309	2398611	DI 1SS254
D310	2339839	ZD HZS5C3
D315	2398611	DI 1SS254
D316	2398611	DI 1SS254
D318	2398611	DI 1SS254
D319	2398611	DI 1SS254
D320	2334324	ZD RD36EB3
D401	CH00151M	DI DSM1S02
D402	2398611	DI 1SS254
D403	2398611	DI 1SS254
D404	2398611	DI 1SS254
D405	2398611	DI 1SS254
D406	2398611	DI 1SS254
D407	2398611	DI 1SS254
D408	2398611	DI 1SS254
D409	2398611	DI 1SS254
D410	2398611	DI 1SS254
D411	2398611	DI 1SS254
D502	2398611	DI 1SS254
D503	2398611	DI 1SS254
D504	2339839	ZD HZS5C3

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SYMBOL NO.	PART NO.	PART DESCRIPTION
D505	2331827	ZD HZ-9 (C1)
D506	2331827	ZD HZ-9 (C1)
D507	2331827	ZD HZ-9 (C1)
D511	CH00151M	DI DSM1SD2
D601	2334243	ZD RD16E(B2)
D602	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
D603	2398611	DI 1SS254
D604	2331807	ZD HZ-6 (C1)
D605	CH00151M	DI DSM1SD2
D606	CH00151M	DI DSM1SD2
D607	CH00151M	DI DSM1SD2
D608	CH00031M	DI AU02V1 (HHEA MD) (HSCC MD) (YOKOHAMA)
D609	2334305	ZD RD30E (B4)
D610	2398611	DI 1SS254
D611	2398611	DI 1SS254
D612	2398611	DI 1SS254
D614	2398611	DI 1SS254
D615	2398611	DI 1SS254
D616	2398611	DI 1SS254
D701	2398611	DI 1SS254
⚠ D702	2348511	DI RS3FS
⚠ D703	2359371	DI S3L60 (HHEA MD) (YOKOHAMA)
⚠ D704	2359371	DI S3L60 (HHEA MD) (YOKOHAMA)
D705	CH00041M	DI ES1FV1 (HHEA MD) (YOKOHAMA)
D706	CH00041M	DI ES1FV1 (HHEA MD) (YOKOHAMA)
⚠ D708	CH00031	DI AU02 (280V) (HHEA MD) (HSCC MD)
⚠ D709	CH00031M	DI AU02V1 (HHEA MD) (HSCC MD) (YOKOHAMA)
⚠ D710	2335042	ZD HZ22 (2L)
D711	2339612M	ZD HZS3BLL
D712	CH00151M	DI DSM1SD2
D713	2398611	DI 1SS254
D714	CH00172M	DI DFM1SD2
D715	2339887	ZD HZS12C1
D716	2398611	DI 1SS254
D717	2398611	DI 1SS254
D718	2398611	DI 1SS254
D719	2398611	DI 1SS254
D801	2331827	ZD HZ-9 (C1)
D802	23383211	DI 1SS270
D805	23383211	DI 1SS270
D831	2331827	ZD HZ-9 (C1)
D832	23383211	DI 1SS270
D861	2331827	ZD HZ-9 (C1)
D862	23383211	DI 1SS270
⚠ D901	2342061	DI D3SB(A)60
D902	CH00172M	DI DFM1SD2
D903	2398611	DI 1SS254
D904	2398611	DI 1SS254
D905	CH00172M	DI DFM1SD2
D906	2334304	ZD RD30EB3
D907	2331827	ZD HZ-9 (C1)
D909	CH00151M	DI DSM1SD2
D912	2339885	ZD HZS12B2
⚠ D913	2359401	DI FMP-G12S
⚠ D914	2359401	DI FMP-G12S
⚠ D915	2359401	DI FMP-G12S
⚠ D916	2349861	DI FMU-G16S
⚠ D917	2359401	DI FMP-G12S
⚠ D918	2359401	DI FMP-G12S
D920	CH00151M	DI DSM1SD2
D921	2339222	ZD HZS27-2L
D922	2339961M	ZD HZS30-1 TA (HHEA MD)
D923	2398611	DI 1SS254
D924	2339855	ZD HZS7B2
D925	2398611	DI 1SS254
D926	2398611	DI 1SS254
D927	2398611	DI1SS254
D928	2339892M	ZD HZS15-2 TA
D929	2398611	DI 1SS254
D930	2398611	DI 1SS254
D931	2398611	DI 1SS254
⚠ D932	2339961M	ZD HZS30-1 TA (HHEA MD)
D933	2398611	DI 1SS254
⚠ D934	2339042	ZD HZS7A2L
D935	2398611	DI 1SS254
D936	2398611	DI 1SS254
D937	2398611	DI 1SS254
D938	2398611	DI 1SS254
D939	2398611	DI 1SS254
D940	2339981	ZD HZS36-1
D941	CH00172M	DI DFM1SD2
D942	CH00172M	DI DFM1SD2
D943	2398611	DI 1SS254
D944	2398611	DI 1SS254
D945	2398611	DI 1SS254
D946	CH00151M	DI DSM1SD2
D947	CH00151M	DI DSM1SD2
D948	CH00151M	DI DSM1SD2
D949	CH00151M	DI DSM1SD2
D950	2339697	LED SLH-56MC35H
D951	2339697	LED SLH-56MC35H
D952	2339697	LED SLH-56MC35H
D953	2339697	LED SLH-56MC35H
D954	2339697	LED SLH-56MC35H
D955	2331785	ZD HZ4(B2)
D956	2339983M	ZD HZS36-3 TA (HHEA MD)
D957	2398611	DI 1SS254
D958	2398611	DI 1SS254
D959	CH00172M	DI DFM1SD2
D968	2339892M	ZD HZS15-2 TA
D970	2339881M	ZD HZS12A1
D971	2339892M	ZD HZS15-2 TA
D972	2398611	DI 1SS254
D973	2331785	ZD HZ4(B2)
D974	2334304	ZD RD30EB3
D975	2339693	LED SLH-56VC35H
D976	2339855	ZD HZS7B2
D977	2398611	DI 1SS254
D978	2339942M	ZD HZS24-2 TA
		TRANSFORMERS
⚠ T701	2260291	HORIZONTAL DRIVE TRANSFORMER
⚠ T702	2436493	FLYBACK TRANSFORMER
⚠ T703	2272762	SPC TRANSFORMER
⚠ T901	BT00161	POWER TRANSFORMER (HHEA MD)
⚠ T902	BT00151	SWITCHING TRANSFORMER (HHEA MD)
		COMPOUND COMPONENTS
⚠ EFPK	AZ00003	CRX FOCUS PACK
HM01	2574762	REMOTE CONTROL RECEIVER
H001	2791754	DSS306-55B101M
H002	2791754	DSS306-55B101M
H003	2791754	DSS306-55B101M
H004	2791754	DSS306-55B101M
H005	2791754	DSS306-55B101M
H006	2791754	DSS306-55B101M
H008	2791754	DSS306-55B101M
H009	2791754	DSS306-55B101M
H010	2791754	DSS306-55B101M
H011	2791754	DSS306-55B101M
H012	2791754	DSS306-55B101M
⚠ H901	2793312	CAPRISTOR
H902	2793312	CAPRISTOR
U002	HP00092	P IN P UNIT KC-011S (HHEA MD)
		FUSES
⚠ F902	2722358	FUSE 5A
⚠ F903	FN00071R	FUSE 5A (HHEA MD)
⚠ F905	2722389M	FUSE 4A
⚠ F906	2722353	FUSE 1.6A

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SYMBOL NO.	PART NO.	PART DESCRIPTION
		COILS
LA02	2123763	RADIAL COIL 100MH
LC01	2123763	RADIAL COIL 100MH
LC02	2123109M	LAL02 AXIAL COIL 33MH
LK03	2120482	FILTER COIL 100 MICRO H +-10%
LT01	2120484	FILTER COIL
LT02	2120484	FILTER COIL
LT03	2120484	FILTER COIL
LT06	2120484	FILTER COIL
LW01	2123763	RADIAL COIL 100MH
LY01	2123781	FILTER COIL
LY04	2123763	RADIAL COIL 100MH
L001	2123781	FILTER COIL
L003	2123763	RADIAL COIL 100MH
L301	2146092	TRAP COIL
L302	2123116M	LAL AXIAL COIL 100 MICRO H +-10%
L303	2123763	RADIAL COIL 100MH
L402	2123461	FERRITE BEADS CORE
L403	2123461	FERRITE BEADS CORE
L404	2123461	FERRITE BEADS CORE
L405	2123781	FILTER COIL
L502	2123763	RADIAL COIL 100MH
L601	2123461	FERRITE BEADS CORE
L701	BH00212R	FILTER COIL (HHEA MD)
L702	2771893	FERRITE BEADS CORE
L703	2771892	FERRITE BEADS CORE 004
L704	2771892	FERRITE BEADS CORE 004
L705	2124181	CHOKE COIL
L706	2120484	FILTER COIL
L707	2122095	FILTER COIL 27 MICRO H
L708	2120482	FILTER COIL 100 MICRO H +-10%
L709	2122211	FILTER COIL 12 MICRO H +-10%
L710	BZ00315	LINEARITY COIL (HHEA MD)
L711	BZ00314	LINEARITY COIL 140UH
L713	2121181	FILTER COIL
L803	2123763	RADIAL COIL 100MH
⚠ L901	BZ00571	LINE FILTER (HHEA MD)
⚠ L902	BZ00561	LINE FILTER (HHEA MD)
L904	2122653	FERRITE BEADS CORE
L907	BH00201R	FILTER COIL (HHEA MD)
L908	BH00201R	FILTER COIL (HHEA MD)
L909	BH00201R	FILTER COIL (HHEA MD)
L912	BH00201R	FILTER COIL (HHEA MD)
L913	BH00201R	FILTER COIL (HHEA MD)
L916	BH00214R	FILTER COIL 100MH
L917	BH00214R	FILTER COIL 100MH
L918	BH00214R	FILTER COIL 100MH
L923	BH00212R	FILTER COIL (HHEA MD)
L924	BH00214R	FILTER COIL 100MH
L925	BH00214R	FILTER COIL 100MH
L926	2161152	FILTER COIL
		SWITCHES
SM01	FE00061	1P KEY SWITCH (HHEA MD)
SM02	FE00061	1P KEY SWITCH (HHEA MD)
SM03	FE00061	1P KEY SWITCH (HHEA MD)
SM04	FE00061	1P KEY SWITCH (HHEA MD)
SM05	FE00061	1P KEY SWITCH (HHEA MD)
SM06	FE00061	1P KEY SWITCH (HHEA MD)
SM07	FE00061	1P KEY SWITCH (HHEA MD)
SS01	2622441	SLIDE SWITCH
S301	FD00011	SLIDE SWITCH
S901	2640576	RELAY (HHEA MD)
		MISCELLANEOUS
1	UE00453	CONTROL BLOCK
2	81180100	HEX HEAD T-SCREW
3	81180114	8 X 1/4 T-SCREW
4	NA03233	LENS CRT METAL (55EX15K)
4	4492092	LENS CRT METAL (50EX14BV)

SYMBOL NO.	PART NO.	PART DESCRIPTION
9	4524911	HEXAGON FLANGEHEAD 4 x 12
12	4137977	4 X 25 SELF TAPPING SCREW
13	KS00043	MIRROR (50EX14BV)
13	KS00044	MIRROR (55EX15K)
15	4520771	4 x 18 TAPPING SCREW WITH WASHER (50EX14BV)
19	4331945	MIRROR HOLDER
20	4137975	4 x 16 TAPPING SCREW WITH WASHER
21	QD00532	CABINET ASS'Y (50EX14BV)
21	QD01411	CABINET ASS'Y (55EX15K)
22	QD01531	BACK COVER (55EX15K)
23	H810191	8 X 5/8 PAN HEAD DRYWALL SCREW(55EX15K)
24	55050001	MIRROR BOARD
26	55040002	MIRROR CLEAT
27	NT00075	SCREEN FRAME ASS'Y (50EX14BV)
27	NT00076	SCREEN FRAME ASS'Y (55EX15K)
28	H310902	EXTRUSION END CAP (L) (55EX15K)
29	H310512	END CAP (50EX14BV)
29	H310901	EXTRUSION END CAP (R) (55EX15K)
30	H310932	DECO RAIL (55EX15K)
30	H310933	DECO RAIL (50EX14BV)
⚠ 31	3393743	DELTA 77 A/B LENS ASS'Y (G)
⚠ 32	3393744	DELTA 77 A/B LENS ASS'Y (R/B)
33	H310121	PLASTIC RIVET
34	H520482	LOWER REAR COVER (55EX15K)
34	H520581	LOWER REAR BOARD ASS'Y (50EX14BV)
35	NJ00571	VCR CONNECTOR TUBE (50EX14BV)
36	55100027	MIDDLE SHELF (50EX14BV)
37	63066861	DOOR SLIDER (50EX14BV)
38	34020007	DOOR ASS'Y WITH HINGE (50EX14BV)
	4303211	CENTER RAIL METAL
	61020001	DUOMATIC HINGE
	61030001	DUOMATIC MOUNTING PLATE
	63066861	FLIPPER DOOR SLIDER
	63068861	PIVOT ROLLER
	84000002	METAL CATCH
	H410311	MAGNETIC LOU
⚠ 40	4876421	LENS CRT BLOCK ASS'Y (R)
⚠ 41	4876422	LENS CRT BLOCK ASS'Y (G)
⚠ 42	4876423	LENS CRT BLOCK ASS'Y (B)
45	3189764	SCREEN ASS'Y (50EX14BV)
45	3189846	SCREEN ASS'Y (55EX15K)
47	H310922	SPEAKER GRILL (55EX15K)
47	32110021	SPEAKER GRILL (50EX14BV)
54	MK00121	METAL SHELF SUPPORT
55	H420671	MIRROR METAL A
56	H420681	MIRROR METAL B
EFUS	2687791	F-US ADAPTOR
EF92	2721351	FUSE HOLDER
EF96	2721351	FUSE HOLDER
E10	2776542	VM MAGNET
⚠ E12	BY00501	DEFLECTION YOKE
E301	HL00224	REMOTE CONTROL CLU-415
⚠ E801	2698671	CPT SOCKET
⚠ E831	2698671	CPT SOCKET
⚠ E861	2698671	CPT SOCKET
E9BN	4520883	M3X12 SCREW WITH WASHER
E9DN	4520883	M3X12 SCREW WITH WASHER
E9IN	4520883	M3X12 SCREW WITH WASHER
E9IS	KL00051	IC SPRING
⚠ E901	2972523	POWER SUPPLY CORD (HHEA MD)
E902	3772201	AC CORD HOLDER
E903	3739671	CORD HOLDER
⚠ GF01	CJ00071R	SPARK GAP
⚠ G701	CJ00071R	SPARK GAP
⚠ G801	CJ00071R	SPARK GAP
⚠ G802	CJ00071R	SPARK GAP
⚠ G831	CJ00071R	SPARK GAP
⚠ G832	CJ00071R	SPARK GAP
⚠ G861	CJ00071R	SPARK GAP
⚠ G862	CJ00071R	SPARK GAP
JS01	ER00121	LEVER TERMINAL (HHEA MD)
JY01	ES00002	11P PIN JACK WITH S TERMINAL (HHEA MD)
NF02	4520883	M3X12 SCREW WITH WASHER

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
NK06	4520885	M3X16 SCREW			
N201	QR02291	INSTRUCTION BOOK			
N402	4520883	M3X12 SCREW WITH WASHER			
N502	4520883	M3X12 SCREW WITH WASHER			
N602	4520883	M3X12 SCREW WITH WASHER			
N604	4520883	M3X12 SCREW WITH WASHER			
N702	4520883	M3X12 SCREW WITH WASHER			
N704	4159425	3X16 TAPPING SCREW			
N730	4159427	3X10 TAPPING SCREW WITH WASHER			
N801	3763751	SK BINDER			
N803	4520883	M3X12 SCREW WITH WASHER			
PFJ	2902266	7P SUB MINI PLUG PIN			
PI1	2663821	2P PLUG PIN			
PI2	2663821	2P PLUG PIN			
PMB	2665272	4P PLUG PIN WITH BASE			
PMG	2665272	4P PLUG PIN WITH BASE			
PMR	2665272	4P PLUG PIN WITH BASE			
PP	2661752	PLUG PIN			
PP	2661752	PLUG PIN			
PP31	2661751	PLUG PIN WITH BASE			
PR	2661753	PIN PLUG WITH BASE			
PSD2	2674631	5P CONNECTOR			
PSD3	2674634	8P CONNECTOR			
PSD4	2674635	10P CONNECTOR			
PSD6	2674631	5P CONNECTOR			
PTS	2663821	2P PLUG PIN			
PY2	2902263	4P SUB MINI PLUG PIN			
PY2	2902263	4P SUB MINI PLUG PIN			
P802	2661756	1P PLUG PIN WITH BASE			
P832	2661756	1P PLUG PIN WITH BASE			
P862	2661756	1P PLUG PIN WITH BASE			
⚠ SP401	2415072	SPEAKER (L) (50EX14BV)			
⚠ SP401	2412921	SPEAKER (L) (55EX15K)			
⚠ SP402	2415072	SPEAKER (R) (50EX14BV)			
⚠ SP402	2412921	SPEAKER (R) (55EX15K)			
U001	2429691	FRONTEND V8-A68FT (HHEA MD) (HSCC MD)			
U301	CW00021	MODULE UGL-331KNT			
V1R	2471384	180CSB22R (KU)			
V1G	2471385	180CSB22G (KU)			
VIB	2471386	180CSB22B (KU)			
X001	2168831	CRYSTAL			
X301	2786685	CRYSTAL			
X501	2791501	CRYSTAL HC-49/U			
	UE01811	LENS CRT CHASSIS B. ASS'Y (50EX14BV)			
	UE01812	LENS CRT CHASSIS B. ASS'Y (55EX15K)			

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